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UNITED STATES
DEPARTMENT OF AGRICULTURE
CIRCULAR No. 203

Washington, D. C.

April, 1932

MIDDAY MEALS
FOR PRESCHOOL CHILDREN
IN DAY NURSERIES AND
NURSERY SCHOOLS

By

MARY E. SWEENY

Assistant Director, Merrill-Palmer School

and

CHARLOTTE CHATFIELD

Specialist in Foods and Nutrition, Foods and Nutrition Division
Bureau of Home Economics



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By MARY E. SWEENEY, *Assistant Director, Merrill-Palmer School*, and CHARLOTTE CHATFIELD, *Specialist in Foods and Nutrition, Foods and Nutrition Division, Bureau of Home Economics*

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INTRODUCTION

The importance of properly selected food has long been recognized as a factor determining the health of young children, but until recently meal planning has been based upon race experience, individual preferences, and available food materials. Science is gradually revealing the basic facts regarding food composition and human requirements so that meal planning may be put more and more on a scientific basis.

In the development of the nursery school, the need of organizing the available information pertaining to food was readily recognized, and now practically all nursery schools are basing their feeding on scientific principles. Because of the constant demand for information concerning the feeding of children this circular was planned. It includes some of the fundamentals of child feeding, together with certain specific information on the composition of prepared foods. It is designed especially for those responsible for feeding groups of preschool children one or two meals a day, but since the questions that arise in feeding children in nursery schools also concern hospitals and other institutions where groups of young children must be fed, and homes where mothers of young children are confronted with the problem of selecting suitable food, it is hoped that it will also prove helpful to them.

The first problem in feeding is to ascertain the nutritive requirements, or lacking these, to establish standards for the individual or

¹ Acknowledgment is made to Lila Skinner Grossman, of the Merrill-Palmer School, Detroit, Michigan, for her work on the recipes and the food-intake data; to Edith Hawley, formerly senior food economist, and Rowena Schmidt Carpenter, associate specialist in child nutrition, both of the Bureau of Home Economics, for their work in the preparation of the manuscript.

group. After that comes the question of interpreting these needs in terms of available food materials. The discussion here follows this order and considers total energy and the six nutrients, protein, carbohydrate, fat, calcium, phosphorus, and iron. These were chosen because they are measurable and, with the possible exception of carbohydrate and fat, they are often furnished in insufficient amounts. Although vitamin needs can not be expressed in quantitative terms, special thought has been directed toward including in the meal plans liberal amounts of foods rich in these factors.

FOOD STANDARDS FOR YOUNG CHILDREN

Very little is known about the actual physiological food requirements of children. Until data on these needs become available, the food intake of normal healthy children seems the best basis for formulating standards or criteria on adequacy of children's diets. Few such studies of normal, healthy children have been made. Holt and Fales (4, 5, 6, 7),² who reviewed the work of a number of early German investigators, point out that the findings of these studies were for the most part based upon observations of a comparatively small number of children of widely varying ages. Further, judged by present standards, a number of these children were far underweight or overweight. As a result the number of normal children in any one age group was too small to be considered representative.

After reviewing the work of the earlier investigators, Holt and Fales reported the first extensive study of the food consumption of children who were determined by medical examination to be normal. The food intake over a 4-day period of 106 healthy children ranging from 1 to 18 years was determined by the individual method. The protein, carbohydrate, and fat content of the diet was calculated mainly from Locke's tables (8). The total daily intake and also the consumption per kilo body weight were reported by age groups.

The physiological fuel value of the food consumed, calculated from the protein, carbohydrate, and fat in the diet, was considerably higher between the ages of 2 and 4 and between 5 and 6 than the authors' schedule of calories per kilogram. Also it was higher than the "suggested total daily calories" in the 2 to 3 and the 5 to 6 year groups. These theoretical values, however, seem rather too low for preschool children, judging by records of intake made by other workers as well as by Holt and Fales' own findings. For this reason only the data from actual consumption are shown in the comparisons which follow.

A study similar in plan to that of Holt and Fales was made in 1924 by Goodhue,³ who confined her study to 31 children under 7 years of age. She states that all of the children were in good health, as determined by medical examination, and were of average or superior development. The height of these children was measured but not reported, and the weight was given for only 19 of the children between 2 and 6. In reviewing the data on these it appears that 7 children were probably very much overweight for their height, judging by the "average" weights with which they are compared, and their food intake therefore could hardly be expected to be representative.

² Italic numbers in parentheses refer to Literature Cited, p. 45.

³ GOODHUE, A. L. A STUDY OF THE DIETS OF HEALTHY CHILDREN FROM TWO TO SIX YEARS, BY THE INDIVIDUAL METHOD. 1924. (Unpublished thesis, Univ. of Chicago.)

The food intake was weighed for one day only. This was compared with a detailed report of the intake measured by the mother for the following seven days, to be sure that it represented the child's usual diet. The content of calcium, phosphorus, and iron in the diet, as well as that of protein, carbohydrate, and fat, was calculated. The results of the study are included here for comparison, since there are so few studies that show the mineral consumption of preschool children.

A third study of this nature was made in 1926 by McKay (9), who obtained the actual weighed food intake of 55 children between 2 and 6 years of age over a 4-day period. Twenty-five of the children were in private homes and thirty in an orphanage. All were examined by a pediatrician and pronounced normal physically, but judging by available age-height tables, the orphanage children were far under normal in stature. For this reason, only those from private homes are considered here. Data on the food intake of the 25 children from private homes are quoted here for purposes of comparison, although 9 of them seem much overweight for their height. The average weights of the 3 to 4 and of the 4 to 5 year groups are distinctly above the usual weights for these ages.

An unpublished study of 124 reports of the food intake of 97 children at the Merrill-Palmer School gives further data on food consumption. In this study the same child may appear twice within the 3-year period considered but not more than once in the same age group. The children were from private homes representing a wide range of economic status. The school program includes the cooperation of the parents in submitting three times a year a report of the amounts of food, by measure, eaten by their children over a period of seven consecutive days. From several hundred such reports these 124 were selected as being as accurate as could be obtained, complete, and representative of the diets of normal, healthy children.

The condition of these children was determined by a series of physical examinations, supplemented by urine analyses and blood counts. Growth records were kept over the period of enrollment in the school. In a study of growth, reported in a publication of the school (14), data from physical measurements of most of these 97 children were included with those on a larger group. Some of the same food records were also used in that report, but 34 new records have been substituted here for 35 of those used in the earlier study.

The figures for food intake of the child during the school day represent the actual weight of the food eaten at school and the nutritive value was calculated according to servings reported in the recipes in this circular. The food intake at home was calculated from the home record which reported measured amounts of the food consumed. The measures, such as servings and tablespoons, were interpreted according to Locke (8, 1928 *ed.*), and the calculations for protein, fat, and carbohydrates were taken from that source. The intake for Saturdays and Sundays was computed entirely from the mother's measurements and calculated from Locke's tables.

Each child's intake represents the average for seven days and is reported in terms of protein, fat, carbohydrate, and calories. The averages for the age groups are made from these individual averages

for seven days. These figures are presented here as total intake per day, and for purposes of comparison with other studies they are also reported as intake per kilogram of body weight.

These four studies made by the individual method on children that were considered normal probably give the best information so far available on the food consumption of the preschool child. The results are summarized in Table 1. The actual number of children studied by this method is still relatively small. Two hundred and eleven records in all are included here.

The general agreement between averages in the results of the different workers, however, seems remarkable, considering the number of persons making the investigations, the variations in the technic followed, and the unavoidable errors in estimating the composition of prepared dishes. Over and above all of these variations the actual differences among the individual children studied must be considered, and these differences are apparently very wide.

The data in Table 1 illustrate the increase in the total food intake with increasing age; and with certain exceptions the results of the different workers agree moderately well. The decreased intake per unit of body weight with each increase in age level is shown fairly well in the lower part of Table 1.

Variations in weight of the children under observation apparently account for some of the widest discrepancies among the average values shown in this table. For example, Goodhue's three children in the age group from 3 to 4 were all much overweight for their age and presumably for their height. As a group their total consumption was not remarkable, but their intake per kilo, in calories particularly, was very low. In the same age group the average fuel value for Holt and Fales' 10 children is high per kilo even though the total calories per day are somewhat low. This condition is apparently due to the fact that three boys in this group were much underweight, if their weights can be judged by a comparison of the graphs.

In the 4 to 5 year group of the Merrill-Palmer study the consumption of fat and the total fuel value are lower than in the 3 to 4 year group. Of the 47 records on children over 4 years, 6 were distinctly low in total calories, and 1 was extremely low even in calories per kilogram.

The data on fuel value of the diet in the age group between 5 and 6 are not in line with the findings on children in other age groups. This is particularly noticeable in calories per kilogram. Goodhue's values for total consumption in this group are probably very much too high. In spite of the fact that a good proportion of the group studied appeared to be much overweight, the intake per kilo was considerably higher than would be expected judging by the results on children at other ages. Holt's children in the same age group also average higher in calories per kilo, in all probability, than normal values. This may be due, in part at least, to the fact that one very peculiar record was included. It appears that one underweight girl's intake was so high in fat that the calories per kilo were extremely high, approximately double some of the lowest values in the same group.

TABLE 1.—Food intake of preschool children in terms of organic nutrients and fuel value
AVERAGE DAILY CONSUMPTION PER CHILD

Investigator	Children studied						Total protein consumed by children of—				Total fat consumed by children of—				Total carbohydrates consumed by children of—				Total fuel value consumed by children of—			
	2-3 years	3-4 years	4-5 years	5-6 years	Num-ber	years	2-3 years	3-4 years	4-5 years	5-6 years	2-3 years	3-4 years	4-5 years	5-6 years	2-3 years	3-4 years	4-5 years	5-6 years	2-3 years	3-4 years	4-5 years	5-6 years
	Num-ber	Num-ber	Num-ber	Num-ber			Grams	Grams	Grams	Grams	Grams	Grams	Grams	Grams	Grams	Grams	Grams	Grams	Calories	Calories	Calories	Calories
Merrill-Palmer	30	47	47	---	Num-ber	years	50	52	53	---	54	62	59	---	178	185	186	---	1,399	1,506	1,487	---
Holt and Fales ¹	11	10	12	10	---	---	53	58	56	60	49	52	57	61	165	158	173	215	1,313	1,332	1,429	1,649
McKay ²	12	6	7	---	---	---	42	50	57	---	49	59	71	---	149	176	212	---	1,209	1,429	1,721	---
Goodhue	2	3	6	8	---	---	44	54	52	68	47	46	60	97	161	188	217	241	1,246	1,380	1,617	2,108

AVERAGE DAILY CONSUMPTION PER KILOGRAM OF BODY WEIGHT

Investigator	Children studied						Protein per kilogram, children of—				Fat per kilogram, children of—				Carbohydrate per kilogram, children of—				Fuel value per kilogram, children of—			
	2-3 years	3-4 years	4-5 years	5-6 years	Num-ber	years	2-3 years	3-4 years	4-5 years	5-6 years	2-3 years	3-4 years	4-5 years	5-6 years	2-3 years	3-4 years	4-5 years	5-6 years	2-3 years	3-4 years	4-5 years	5-6 years
	Num-ber	Num-ber	Num-ber	Num-ber			Grams	Grams	Grams	Grams	Grams	Grams	Grams	Grams	Grams	Grams	Grams	Grams	Calories	Calories	Calories	Calories
Merrill-Palmer	30	47	47	---	Num-ber	years	3.6	3.3	3.1	---	4.0	4.0	3.5	---	13.0	11.8	10.8	---	102	96	87	---
Holt and Fales ¹	11	10	12	10	---	---	3.9	4.0	3.2	3.3	3.6	3.6	3.3	3.3	12.1	11.2	9.8	11.5	96	93	82	89
McKay ²	12	6	7	---	---	---	3.1	3.0	2.9	---	3.6	3.6	3.7	---	11.0	10.6	10.9	---	90	87	89	---
Goodhue	2	3	6	8	---	---	3.3	3.0	2.7	2.9	3.5	2.5	3.0	4.2	11.4	10.5	11.1	10.5	90	77	82	91

¹ The physiological fuel values reported here represent calculations from protein, fat, and carbohydrate actually consumed, rather than the authors' theoretical values.
² Only children from private homes are included.

As a measure of the intake of normal children from 2 to 5 years old, the average values from the Merrill-Palmer group seem fairly satisfactory. It has been shown (14) that the children at this school are generally a little above average physical development for their age, and their total consumption may therefore be above the average. It would be expected, though, that they would be strictly comparable with other normal or superior children on the basis of consumption per kilo of body weight. This intake is used as a criterion of adequacy in the meal plans discussed later. The figures thus derived are referred to as standards or allowances.

Less work has been done on the mineral standards for young children. Both McKay (9) and Goodhue⁴ have determined the amount of calcium, phosphorus, and iron in the diets of the children they studied. In Table 2 these data are presented for the individual age groups in terms of total daily consumption, and also of consumption per kilo of body weight. It is probably significant that consumption per kilo decreases progressively with increase in age.

TABLE 2.—Daily mineral intake of preschool children according to McKay¹ and Goodhue

Author	Age group	Children in group	Average age	Calcium		Phosphorus		Iron	
				Total	Per kilo-gram	Total	Per kilo-gram	Total	Per kilo-gram
	Years	Number	Months	Grams	Gram	Grams	Gram	Milli-grams	Milli-gram
McKay.....	2-3	12	31	0.937	0.069	0.973	0.072	6.9	0.51
Goodhue.....	2-3	2	27	.803	.061	.931	.069	7.5	.55
McKay.....	3-4	6	40	1.013	.061	1.091	.066	8.8	.54
Goodhue.....	3-4	3	39	1.113	.064	1.184	.068	9.0	.51
McKay.....	4-5	7	53	1.188	.061	1.273	.065	9.8	.50
Goodhue.....	4-5	6	56	1.144	.058	1.154	.059	8.7	.45
Do.....	5-6	8	66	1.313	.057	1.403	.060	10.4	.44
McKay average ¹			39		.055		.069		.51
Goodhue average ²			54		.059		.062		.47

¹ Only children from private homes are included.

² Weighted according to the number of children in each age group. Total number is 25 in the McKay, and 19 in the Goodhue study.

Mineral requirements have been investigated by means of metabolism experiments. Recommendations based on studies of this sort usually make a generous allowance over the quantities determined, and are perhaps the safest criteria to use in planning diets of children. Sherman (12) concluded from a study of calcium and phosphorus metabolism in 12 children 3 to 14 years of age that it is advisable for the growing child to have at least 1 gram each of calcium and phosphorus per day. He makes no definite statement about the iron requirement of children except that it is probably greater relatively than for adults (12, p. 340) for whom he recommends a total of at least 15 milligrams per day, or 0.5 milligram per hundred calories.

Recently, Rose et al. (11) studied the iron metabolism of one girl of 2 years and 7 months, weighing about 14 kilograms. They concluded that the child's actual requirements were about 5.7 milligrams per day, and they recommend for such a child about 50 per cent more, or 8.5

⁴GOODHUE, A. L. Op. Cit. (See footnote 3, p. 2)

milligrams. Expressed in terms of body weight, this would be 0.61 milligram per kilogram.

It may be assumed that younger children require more per kilo, and older children less, but this recommendation seems a liberal one for children from 2 to 4 years of age. It would correspond to a total intake of about 8 milligrams at 2 and 10 milligrams at 4. Probably an allowance of 12 milligrams at 6 would be exceedingly generous.

Sherman's recommendations for a gram each of calcium and phosphorus per day are used in judging the meal plans presented in this circular. An allowance of 9 milligrams of iron per day, or about 0.6 milligram per kilo of body weight is used here to measure the adequacy of the diet for the 3-year-old child.

FACTORS AFFECTING THE CHILD'S FOOD INTAKE

APPETITE

The nutritive value of the food is not the only consideration in feeding the young child. His appetite or desire to eat, which is affected by many factors, internal and external, has an important bearing on his food intake. Technically defined, appetite is a pleasurable sensation associated with the memory of food, and with its taste, smell, and appearance. In order to attach pleasant memories to food all associations during the meal hour should be as happy as possible, and food should be attractive in flavor, odor, color, and texture. Careful preparation and attractive service contribute also to the esthetic appeal of food. Serving food that is burned, undercooked, lumpy, or too hot may take away the appetite and give rise to a prejudice that it requires months of reeducation to overcome.

A diet containing the right proportions of the different nutrients tends to promote a good appetite. A specific influence on the appetite seems to come from vitamin B, the antineuritic factor. Experiments upon animals have shown that diets lacking in vitamin B, even though adequate in all other respects, result in loss of appetite in a very short time.

Small portions of food and an opportunity for second servings inspire a much greater desire to eat than large portions. Small servings also help the child form the habit of finishing what is placed on his plate.

Appetite is stimulated physiologically by hunger contractions in the empty stomach. A régime that places meals far enough apart and reduces or eliminates the practice of eating between meals allows normal hunger to develop and stimulates the desire for food.

The physical and emotional condition of the child plays an important rôle. The healthy, active, well-nourished child usually has at mealtime a noticeable eagerness for food that is often absent in the child who is physically below par. Frequent colds, ear troubles, and other infections all seem to affect the appetite. In a healthy child a sudden lack of interest in food may be a sign of approaching illness or fatigue. Children who are fatigued from over strenuous play, excitement, or insufficient sleep may show a disinterest in or even an active distaste for food. Their desire to eat is usually restored by a short rest just before mealtime. Emotional upsets from fear, anger, or disappointment, if experienced near the meal

hour, also affect the appetite. Urging children to eat a full meal under any of these conditions is not advisable. It is better for them to eat nothing or to eat lightly, and to rest quietly until the next meal. If poor appetite becomes chronic, the advice of a physician should be sought.

This entire discussion of appetite and the following discussion of food habits are based solely upon the normal child who has no food idiosyncrasies. It is recognized, however, that some children have food sensitizations which seem to inhibit their desire for food or the ability to utilize it properly. Such cases need special medical attention and are not considered here.

FOOD HABITS

The child whose mealtimes have always been treated without stress or apparent concern is not likely to develop faulty food habits. Wholesome food properly prepared and given to the child without special comment is usually eaten as a matter of course.

An attitude of willing acceptance of new foods should be created in children little by little. New and unfamiliar foods must be prepared in an appetizing way, and are best presented at first along with foods that are liked. Positive suggestion in the form of an occasional hint in advance that there will be something new and very good for dinner helps create an interest in a new food. Suggestion is sometimes employed very subtly at the nursery school when the teacher comments casually about the good dinner, or expresses her fondness for some special food served. This method loses its effect if overdone. Silent suggestion in the form of setting a good example may serve better. Children are quick to imitate their elders, especially those of whom they are particularly fond. Since they are as likely to follow a bad example as a good one or to be influenced by negative suggestion, parents and teachers can hardly be too careful. Negative suggestion is unwittingly employed when adults refuse food or discuss their food dislikes in the child's presence.

It is bad also to comment on any dislikes or refusals the child has shown. The unfortunate effects of too much mealtime attention at home are often evident when children come to the nursery school. Many a child has found that by refusing his food at home he could create an exciting emotional situation centering about himself. He therefore repeated this behavior until every mealtime became the occasion for a session of coaxing or threatening, for tears, or a temper tantrum, upsetting both to child and adult. In the nursery school there is no coaxing or threatening, and emotional outbursts are ignored, or the child is taken away from the table quietly. Such scenes are seldom repeated because they are ineffective in attracting the attention for which they are staged.

It sometimes happens that children who are finicky eaters at home eat without question whatever is set before them in the nursery school. The influence of other children is undoubtedly an important factor here, because most children are quick to conform to the behavior of the group. Absence of special adult attention is another factor. The child in the school soon realizes that no one is there to supervise every mouthful, and it is to his own interest to eat without waiting to be coaxed.

Children sometimes invent ingenious devices to avoid or to delay eating. Chewing but not swallowing, very slow eating, leaving the table to go to the toilet, playing with the food, and excessive conversation are often definitely schemed by the child to avoid eating. Denying the child his dessert until the main course is finished or removing all of the food and allowing nothing else until the next regular meal seems the best procedure in situations of this kind. Sometimes it is necessary to remove the food at several successive meals before the child learns by experience to eat without delay or refusal. Missing a meal or two is far less likely to harm a child than are emotional scenes at the meal hour. In following this method and others suggested for developing good food habits or correcting faulty ones the cooperation of the family is essential if the results are to carry over into the home situation.

MECHANICAL PROBLEMS

The ease of handling food may influence the amount the child eats. Eating utensils should be suited to the small hands and mouths of the children. Children's knives, forks, and spoons, made like adults' eating utensils but smaller in size, may now be obtained in many designs. Using these from the beginning eliminates the need for learning to use two kinds of eating utensils, as is necessary if the child begins feeding himself with curved-handled baby spoons and food pushers.

The food itself should be easy to manipulate. For example, a lettuce leaf which can be picked up in the fingers, or finely chopped lettuce in a sandwich are easier forms for children to manage than shredded lettuce to be eaten with a fork. Sliced beets can be speared with a fork while diced beets may prove difficult for children to handle either with a fork or a spoon. Peas offer a problem which can be solved by serving them in a nest of mashed potatoes or as a purée. Consistency is important, too. Sauce or gravy should not be too thin if children are to eat with ease and without too much spilling.

It is essential that the child be given different types of food so that he may learn to masticate properly and may develop his teeth and gums by exercising them. Tough foods are not advisable, but vegetables, certain raw fruits, bread crusts, toast, and other foods which offer some resistance in chewing accomplish these ends.

While it is not necessary to consider each of these points at every meal, it is well to have them sufficiently in mind so that feeding difficulties may be avoided, or, if they do occur, may be corrected in a spirit of understanding before poor habits become fixed.

MENU PLANNING

MEETING THE FOOD STANDARDS

Meals should be planned with the entire day's food supply in mind. In nursery schools or institutions where the children do not receive all their food some knowledge of the kind and amount of food they are given at home is necessary in order to plan suitable meals. Reports from the parents showing what the child eats at home each day seem to be the simplest way of obtaining this information. These, together with occasional quantitative reports for a period of one week, provide a fairly accurate index of the food habits of the child.

Reports of this kind were kept by parents of children attending the Merrill-Palmer Nursery School. They showed that the breakfasts and suppers which the children ate at home supplied approximately half of the day's total energy standard. They indicated further that the home meals were low in calcium and iron, as measured by accepted standards. Vitamins also seemed insufficient. Since these conditions are probably general, nursery schools that furnish midday meals should plan to supply about half the day's energy allowance and make up for the mineral and vitamin deficiencies by supplying somewhat more than half the day's standard for these factors. Generous amounts of milk, eggs, fruits, and green leafy vegetables should, therefore, be provided.

Most authorities agree that the young child's heaviest meal is served most suitably at noon, especially if the midday meal can be followed by a rest period. Children who have an early breakfast may need in addition a mid-morning lunch, and similarly, a mid-afternoon lunch may be desirable if the interval between the noon and evening meals is long. These supplementary meals should not be served unless they seem necessary, and should, of course, be considered as supplying a part of the day's food requirement. They are served at the Merrill-Palmer School because the intervals between the three main meals are long, and because it is difficult to give half the day's food supply, particularly half the milk, at one meal. Tomato juice, with cod-liver oil, is served in the middle of the morning, and milk in the afternoon. These two feedings plus the noon meal are planned to furnish half of the day's standard in fuel and more than half of the allowance of certain nutrients.

The nursery-school meal plans presented here are designed to meet half or more of the recommended food allowance for a 3-year-old child. As a standard for a child of this age, the average consumption in terms of body weight of the two age groups, 2 to 3 and 3 to 4, has been used as indicated in Table 3. The daily protein standard, for example, is taken as 3.5 grams per kilo, the mean of 3.6 and 3.3 grams from Table 1. The weight of a 3-year-old child is taken as 14.8 kilograms. This is based on the 77 records in the Merrill-Palmer study, and calculated in the same way by averaging the means from the two age groups. The total daily allowance of protein is calculated as 51 grams.

No quantitative expression can be given to the vitamin needs, but it is assumed that these needs are met if a liberal supply of the vitamin-rich foods is included in the diet. Sources of vitamins A, B, and C are noted in Table 3. Vitamin B as used here refers to the thermolabile antineuritic factor sometimes designated as vitamin B₁. Vitamin D, which is especially important for children, is supplied largely through cod-liver oil. Among the natural foods liver and egg yolk are the best sources of this vitamin, and milk and butter provide limited amounts. Vitamin G or B₂ is thought by some investigators to be identical with the antipellagric factor. It is essential for normal growth and is supplied by milk, fresh, dried, and evaporated, and by lean meat, fish, and liver.

TABLE 3.—Average intake per unit of body weight and standards for a 3-year-old child, with sources of the food constituents in the meals at the Merrill-Palmer School

Item	Protein	Fat	Carbohydrates	Fuel Value	Calcium	Phosphorus	Iron	Vitamin A	Vitamin B	Vitamin C
Average daily intake per kilo of body weight ¹	Grams 3.5	Grams 4.0	Grams 12.4	Calories 99	Gram	Gram	Gram			
Average daily intake per pound of body weight										
Standard for day ²	1.6	1.8	5.6	45						
One-half standard for day ³	51	59	184	1,468	1.0	1.0	0.009			
Foods in school meals which supply these constituents ⁴	Eggs, milk, meat, fish, cheese.	Butter, cod-liver oil, meat, eggs, milk.	Rice, bread, other cereal products, desserts, potatoes and other starchy vegetables.	734	Milk, fruits, vegetables.	Egg yolk, meat, milk, cereal products.	Green vegetables (especially spinach), egg yolk, meat (especially liver), prunes.	Butter, cod-liver oil, egg yolk, milk, green and yellow vegetables.	Vegetables, fruits, eggs, milk, whole-wheat bread, other whole cereals.	Tomato juice, orange juice, raw vegetables, fruits.

¹ Average intake of 2 to 3 and 3 to 4 year old groups in the Merrill-Palmer study, Table 1.² The average daily intake of a 3-year-old child weighing 14.8 kilos calculated from the intake per kilo, is here considered as standard for purposes of judging adequacy of nursery school meals. Mineral standards are based on work of Sherman (12) and Rose and others (11).³ These quantities are used in judging the adequacy of school meals.⁴ Because the Merrill-Palmer School is in a region where goiter is prevalent, the children are given iodine in the form of tartaric acid diiodide in chocolate tablets (iodostarine tablets), and no special emphasis is placed upon iodine-containing foods.

In menu planning the use of a general outline designed to furnish the necessary food constituents is helpful. The following outline is therefore suggested:

A main dish, usually protein.	A cooked vegetable.
An uncooked, green leafy vegetable (may be used in a sandwich).	Milk as a beverage, and used in cooking.
Whole-wheat bread (in a sandwich).	Fruit or other dessert, usually fruit flavored.
An additional source of carbohydrate.	

A midday meal planned according to this outline, and supplemented by the mid-morning and mid-afternoon lunches, will usually supply about half of the child's daily food allowance.

The same food may be served to all children in the preschool group, but the size of the portions should be varied. The taller, heavier children of 4 and 5 years should have more than the 2 to 3 year olds. The servings of the main dishes in a meal average about one-third cup for the younger group and one-half cup for the older group. Typical portions for the children 1½ to 3 years old are:

Egg soufflé.....	Serving 2 by 2 by 1½ inches.
Buttered carrots and celery.....	One-third cup.
Cabbage sandwich.....	One-half slice of bread.
Milk to drink.....	Two-thirds cup.
Chocolate pudding.....	One-third cup.

Servings of this size are usually eaten by children accustomed to nursery-school lunches. Second servings of sandwiches, milk, or dessert are given to the children who wish them.

TYPICAL NURSERY-SCHOOL MENUS

Four typical menus are given in Table 4. It will be noted that essentially they are like simple meals planned for adults, and with a few changes can readily be adapted to family use. The data on food constituents are based on the recipe calculations which follow. These menus indicate the ways in which the various standards are met, and the resulting figures are summarized in Table 5.

TABLE 4.—Amounts served to a 3-year-old child, together with the nutritive value of each dish

MENU 1

Food	Recipe on page—	Approximate measure	Weight	Protein	Fat	Carbohydrate	Fuel value	Calcium	Phosphorus	Iron
			<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Calories</i>	<i>Gram</i>	<i>Gram</i>	<i>Gram</i>
Scrambled eggs.....	27	¼ cup.....	81.7	8.6	10.1	2.6	136	0.072	0.128	0.0018
Buttered green beans.....	29	½ cup.....	115.0	2.4	7.9	7.3	110	.047	.053	.0011
Baked potato with butter.....	32	1.....	106	2.2	1.0	18.2	90	.014	.057	.0013
Cabbage sandwich.....	35	1.....	18.3	1.4	1.0	7.1	43	.009	.026	.0003
Milk.....	43	¾ cup.....	162.7	5.4	6.5	8.1	113	.195	.151	.0004
Fruit cup.....	39	½ cup.....	89.0	.6	.3	21.1	89	.023	.020	.0004
Tomato juice ¹	43	do.....	82.0	1.0	.2	5.6	28	.005	.012	.0003
Cod-liver oil ¹	43		2.4		2.4		22			
Milk ²	43	½ cup.....	122.0	4.0	4.9	6.1	84	.146	.114	.0003
Total.....				25.5	34.2	76.2	715	.511	.561	.0059
Standard.....				26	29	92	734	.5	.5	.0045
Difference.....				-.5	+5.2	-15.8	-19	+0.011	+0.061	+0.014

¹ Mid-morning serving.

² Mid-afternoon serving.

TABLE 4.—Amounts served to a 3-year-old child, together with the nutritive value of each dish—Continued

MENU 2

Food	Recipe on page—	Approximate measure	Weight	Protein	Fat	Carbohydrate	Fuel value	Calcium	Phosphorus	Iron
			<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Calories</i>	<i>Gram</i>	<i>Gram</i>	<i>Gram</i>
Meat ball.....	23	1.....	51	7.3	3.3	6.8	86	0.023	0.093	0.0011
Creamed cabbage.....	30	½ cup.....	122.5	3.9	7.4	10.6	125	.111	.088	.0008
Stewed tomatoes.....	35	do.....	123.0	3.1	3.2	13.1	94	.022	.060	.0007
Celery sandwich.....	35	1.....	18.3	1.4	1.0	7.1	43	.010	.026	.0002
Milk.....	43	¾ cup.....	162.7	5.4	6.5	8.1	113	.195	.151	.0004
Stewed prunes.....	40	¼ cup.....	92.3	1.0	.2	35.7	149	.027	.051	.0014
Tomato juice ¹	43	do.....	82.0	1.0	.2	5.6	28	.005	.012	.0003
Cod-liver oil ¹	43		2.4		2.4		22			
Milk ²	43	½ cup.....	122.0	4.0	4.9	6.1	84	.146	.114	.0003
Total.....				27.0	29.1	93.1	742	.539	.595	.0052
Standard.....				26	29	92	734	.5	.5	.0045
Difference.....				+1.0	+1.1	+1.1	+8	+.039	+.095	+.0007

MENU 3

Creamed halibut.....	25	½ cup.....	83.7	10.3	6.6	6.0	124	0.061	0.140	0.0006
Buttered peas.....	32	½ cup.....	125.0	5.4	4.3	14.5	118	.027	.121	.0016
Scalloped potatoes.....	33	¾ cup.....	83.3	3.1	4.2	13.2	104	.069	.076	.0007
Watercress sandwich.....	36	1.....	16.7	1.4	1.0	7.0	43	.010	.025	.0003
Milk.....	43	¾ cup.....	162.7	5.4	6.5	8.1	113	.195	.151	.0004
Baked apple.....	36	1 apple (2 tablespoons juice)	172.9	.4	.6	35.3	148	.010	.018	.0004
Tomato juice ¹	43	½ cup.....	82.0	1.0	.2	5.6	28	.005	.012	.0003
Cod-liver oil ¹	43		2.4		2.4		22			
Milk ²	43	½ cup.....	122.0	4.0	4.9	6.1	84	.146	.114	.0003
Total.....				31.0	30.6	95.8	782	.523	.657	.0046
Standard.....				26	29	92	734	.5	.5	.0045
Difference.....				+5.0	+1.6	+3.8	+48	+.023	+.157	+.0001

MENU 4

Macaroni with cheese.....	24	½ cup.....	123.5	6.1	6.0	19.3	156	0.112	0.112	0.0005
Buttered spinach.....	34	do.....	124.0	2.6	3.8	7.1	74	.066	.070	.0035
Lettuce sandwich.....	35	1.....	16.8	1.4	1.0	7.0	43	.008	.025	.0002
Floating island.....	39	¾ cup egg white. ½ cup custard.	90.8	4.9	6.2	9.9	115	.105	.121	.0010
Sponge cake.....	42	1½ by 2¼ by 1½ inches.	31.8	2.7	2.1	17.9	102	.011	.039	.0006
Milk.....	43	¾ cup.....	162.7	5.4	6.5	8.1	113	.195	.151	.0004
Tomato juice ¹	43	½ cup.....	82.0	1.0	.2	5.6	28	.005	.012	.0003
Cod-liver oil ¹	43		2.4		2.4		22			
Milk ²	43	½ cup.....	122.0	4.0	4.9	6.1	84	.146	.114	.0003
Total.....				28.0	33.1	81.2	735	.648	.644	.0068
Standard.....				26	29	92	734	.5	.5	.0045
Difference.....				+2.0	+4.1	-10.8	+1	+.148	+.144	+.0023

¹ Mid-morning serving.² Mid-afternoon serving.

TABLE 5.—*Summary of nutrients yielded by the four menus given*

Menu	Protein	Fat	Carbo- hydrate	Fuel value	Cal- cium	Phos- phorus	Iron
	<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Calories</i>	<i>Grams</i>	<i>Grams</i>	<i>Gram</i>
1.....	25.5	34.2	76.2	715	0.511	0.561	0.0059
2.....	27.0	29.1	93.1	742	.539	.595	.0052
3.....	31.0	30.6	95.8	782	.523	.657	.0046
4.....	28.0	33.1	81.2	735	.648	.644	.0063
Total.....	111.5	127.0	346.3	2,974	2.221	2.457	.0225
Average.....	27.9	31.8	86.6	744	.555	.614	.0056
Standard.....	26	29	92	734	.5	.5	.0045

All of the menus contain generous quantities of calcium and phosphorus when the mid-morning and mid-afternoon feedings are included. Over one-half of the daily standard for iron is contributed by each menu, menus 1 and 4 being well over this amount, and menus 2 and 3 exceeding it slightly. The daily deviations in protein, fat, carbohydrate, and total calories are unimportant. These meals not only meet the food standards here recommended for the child but are attractive in color and appearance and varied in consistency and flavor.

To facilitate the planning of other meals the data from these same recipes are summarized in Tables 6 and 7. Table 6 shows the value of 1 cupful of each of the prepared foods that are easily measured in this way. Table 7 shows the value of a single serving of the other dishes for which recipes are given. Table 8 has been prepared to show which of these dishes are especially rich in calcium, phosphorus, or iron.

TABLE 6.—Comparative values of one cup (one-half pint) of various prepared dishes

Food material	Recipe on page—	Weight	Fuel value	Protein	Fat	Carbo- hydrate	Cal- cium	Phos- phorus	Iron
		<i>Grams</i>	<i>Calories</i>	<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Gram</i>	<i>Gram</i>	<i>Gram</i>
Apple sauce.....	37	260	259	0.6	0.8	62.3	0.014	0.023	0.0006
Apricots, stewed.....	37	282	457	5.7	1.2	105.8	.080	.142	.0017
Asparagus, creamed.....	28	249	203	6.7	11.4	18.3	.132	.136	.0015
Beans, green, buttered.....	29	230	220	4.7	15.8	14.7	.094	.106	.0022
Beets, buttered.....	29	235	143	3.0	6.6	17.8	.054	.073	.0011
Cabbage, buttered.....	29	240	170	3.8	11.6	12.7	.104	.068	.0025
Cabbage, creamed.....	30	245	250	7.7	14.9	21.2	.222	.175	.0016
Carrots, buttered.....	30	231	192	2.3	12.4	17.9	.110	.091	.0012
Carrots and celery.....	30	228	160	2.2	10.7	13.5	.124	.084	.0011
Carrots and peas.....	31	237	204	7.5	8.2	25.2	.079	.188	.0025
Chocolate pudding.....	37	260	332	8.5	12.6	46.1	.285	.247	.0007
Cocoa.....	43	250	256	8.9	10.9	30.5	.288	.255	.0007
Custard sauce.....	38	250	382	14.0	23.2	29.3	.319	.430	.0043
Eggs, baked.....	25	247	375	19.8	25.4	16.6	.240	.327	.0035
Eggs, scrambled.....	27	245	407	25.7	30.3	7.9	.216	.385	.0053
Eggs, scrambled in tomato sauce.....	28	250	323	18.2	18.5	20.9	.103	.267	.0043
Fruit cup.....	39	267	268	1.8	.9	63.4	.068	.060	.0013
Halibut, creamed.....	25	251	373	30.9	19.7	18.0	.184	.420	.0018
Macaroni flavored with cheese.....	24	247	312	12.1	12.1	38.7	.224	.224	.0009
Meat casserole with vege- tables.....	23	249	256	21.9	8.3	23.4	.048	.277	.0042
Milk.....	43	244	169	8.1	9.8	12.2	.293	.227	.0006
Onions, creamed.....	31	245	257	7.5	12.0	29.8	.188	.185	.0014
Orange juice.....	43	250	137	1.5	.0	32.7	.072	.040	.0005
Peas, buttered.....	32	250	236	10.7	8.5	29.0	.054	.242	.0032
Potatoes, creamed.....	32	249	269	7.7	10.3	36.6	.156	.191	.0021
Potatoes, scalloped.....	33	250	311	9.3	12.7	39.7	.207	.227	.0021
Potatoes, mashed.....	33	226	233	4.9	8.0	35.4	.055	.131	.0025
Prunes, stewed.....	40	277	447	3.1	.7	107.0	.082	.153	.0043
Rice pudding with raisins.....	41	265	403	10.6	10.7	65.9	.298	.307	.0016
Rice with tomatoes.....	34	250	238	5.2	7.9	36.6	.024	.125	.0015
Spinach, buttered.....	34	248	147	5.3	7.7	14.2	.131	.141	.0070
Spinach, creamed.....	34	248	195	7.1	10.5	17.9	.198	.181	.0043
Spinach soup, cream of.....	22	240	118	4.9	6.9	9.0	.156	.139	.0038
Tapioca with pineapple.....	42	257	323	8.5	8.3	53.6	.193	.204	.0017
Tomato juice.....	43	246	83	2.9	.5	16.8	.014	.036	.0010
Tomato soup, cream of.....	22	247	212	7.4	11.7	19.1	.176	.182	.0013
Tomatoes, stewed.....	35	246	187	6.1	6.4	26.3	.043	.120	.0015

TABLE 7.—Comparative values of single servings of food

Food material	Measure	Recipe on page—	Weight	Fuel value	Protein	Fat	Carbohydrate	Calcium	Phosphorus	Iron
			<i>Grams</i>	<i>Calories</i>	<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Gram</i>	<i>Gram</i>	<i>Gram</i>
Apples, baked....	1 apple (2 table-spoons juice).	36	172.9	148	0.4	0.6	35.3	0.010	0.018	0.0004
Asparagus, buttered.	5 stalks (1½ tea-spoons liquid).	28	43	27	.8	2.0	1.4	.009	.014	.0004
Celery.....	½ stalk.....	31	6	1	.1	.0	.2	.005	.002	.0000
Cod-liver oil.....		43	2.4	22		2.4				
	½ cup before baking.	38	105	134	6.5	6.8	11.8	.126	.131	.0010
Custard, baked.	With ½ teaspoon jelly.	38	111	150	6.5	6.8	15.7	.127	.131	.0010
Egg soufflé.....	2 by 2 by 1½ inches.	27	44	92	4.0	6.5	4.6	.047	.075	.0008
Eggs, creamed.	½ cup creamed egg; 2¼ table-spoons egg yolks; 4 toast cubes.	26	107.2	178	9.2	11.4	9.6	.095	.166	.0019
Eggs, poached.	1 egg; 4 toast cubes.	26	56.1	93	7.4	5.5	3.7	.038	.105	.0016
Floating island.	½ cup custard.	39	90.8	115	4.9	6.2	9.9	.105	.121	.0010
	¼ cup egg white.	23	51	86	7.3	3.3	6.8	.023	.093	.0011
Meat balls.....	1 ball.....	24	46	88	8.6	3.8	4.9	.020	.104	.0013
Meat loaf.....	½ slice.....	40	16	66	1.5	2.3	9.7	.012	.028	.0003
Oatmeal cookies.	1 cookie.....	40	66	50	.2	.2	11.9	.007	.011	.0001
Pears, canned....	½ pear (4 tea-spoons sirup).	32	106	90	2.2	1.0	18.2	.014	.057	.0013
Potatoes, baked.	1 potato with butter.	41	45	77	1.9	.6	15.9	.011	.018	.0005
Prune whip.....	2 by 2 by 1½ inches.	41	107.5	172	5.4	6.4	23.2	.091	.126	.0018
	With ¼ cup custard sauce.									
Sandwiches:										
Cabbage.....	½ slice bread.....	35	18.3	43	1.4	1.0	7.1	.009	.026	.0003
Celery.....	do.....	35	18.3	43	1.4	1.0	7.1	.010	.026	.0002
Lettuce.....	do.....	35	16.8	43	1.4	1.0	7.0	.008	.025	.0002
Watercress.....	do.....	36	16.7	43	1.4	1.0	7.0	.010	.025	.0003
	1½ by 2¼ by 1½ inches.	42	31.8	102	2.7	2.1	17.9	.011	.039	.0006
Sponge cake.....	With ¼ cup stewed apricots.	42	102.3	216	4.1	2.4	44.4	.031	.075	.0010
Sweetpotatoes, baked.	1 sweet potato with butter.	33	88	106	1.4	1.4	21.8	.015	.036	.0004
Toast, whole wheat, buttered.	½ slice.....	36	15.6	58	1.8	1.5	9.2	.010	.033	.0003
Toast cubes, whole wheat.	4 cubes.....	36	5.7	18	.7	.1	3.7	.004	.013	.0001

TABLE 8.—*Prepared dishes having high content of calcium, phosphorus, or iron arranged according to the amount furnished by one serving*¹

Food	Cal- cium	Food	Phos- phorus	Food	Iron
	<i>Gram</i>		<i>Gram</i>		<i>Gram</i>
Milk ²	0.146	Eggs, creamed ⁵	0.166	Spinach, buttered.....	0.0023
Custard, baked ³	.126	Halibut, creamed.....	.140	Eggs, creamed ⁵	.0019
Floating island ⁴	.105	Custard, baked ³	.131	Eggs, scrambled.....	.0018
Rice pudding with raisins.....	.099	Eggs, scrambled.....	.128	Eggs, poached ⁵	.0016
Cocoa.....	.096	Floating island ⁴	.121	Eggs in tomato sauce.....	.0014
Chocolate pudding.....	.095	Milk ²	.114	Meat casserole.....	.0014
Eggs, creamed ⁵	.095	Eggs, baked.....	.109	Prunes, stewed, pulp.....	.0014
Eggs, baked.....	.080	Custard sauce ⁶	.103	Spinach, creamed.....	.0014
Custard sauce ⁶	.080	Eggs, poached ⁵	.105	Meat loaf ⁹	.0013
Macaroni with cheese.....	.075	Meat loaf ⁹	.104	Potato, baked ¹⁰	.0013
Cabbage, creamed.....	.074	Rice pudding with raisins.....	.102	Spinach soup, cream of.....	.0013
Eggs, scrambled.....	.072	Meat balls ⁷	.093	Eggs, baked.....	.0012
		Meat casserole.....	.092	Custard sauce ⁶	.0011
		Eggs in tomato sauce.....	.089	Meat balls ⁷	.0011
		Cocoa.....	.085		

¹ All of these servings are from recipes pp. 22 to 43, one-third cup unless otherwise indicated.² One-half cup.³ One-half cup before baking.⁴ One-third cup custard sauce and one-fourth cup egg white.⁵ One-third cup creamed egg, 2¾ tablespoons egg yolk, and 4 toast cubes.⁶ One-fourth cup.⁷ One meat ball, 51 grams.⁸ One egg and four toast cubes.⁹ One-half slice, 46 grams.¹⁰ One potato, skin removed, 105 grams, with butter, 1 gram.TABLE 9.—*Menus served for five consecutive days, and the number of children having second servings*¹

Day	Menu	Children having second servings
		<i>Number</i>
Monday	Creamed eggs.....	3
	Buttered cabbage.....	0
	Celery and carrot sandwiches.....	7
	Lettuce leaf.....	0
	Milk.....	3
	Apple tapioca.....	4
	Oatmeal cooky.....	0
Tuesday	Vegetable stew.....	3
	Cottage cheese on lettuce.....	0
	Egg-yolk sandwich.....	11
	Milk.....	4
	Rice pudding with raisins.....	5
	Broiled liver.....	0
	Creamed potatoes.....	1
Wednesday	Celery.....	0
	Cabbage sandwich.....	11
	Milk.....	2
	Baked apple.....	6
	Rice with tomatoes.....	1
	Buttered spinach.....	0
	Cabbage leaf.....	0
Thursday	Cottage-cheese sandwich.....	14
	Milk.....	5
	Baked custard with jelly.....	7
	Scrambled eggs.....	1
	Carrots and peas.....	0
	Lettuce leaf.....	0
	Celery sandwich.....	9
Friday	Milk.....	3
	Stewed apricots.....	7
	Sponge cake.....	0

¹ The average attendance was 37 children daily.

Variety is desirable in meal planning. If meals are planned on the basis of the outline given on page 12, it is easy to check them with the menus for the preceding week and thus prevent serving the same combination of dishes two weeks in succession, or the same dish two days in succession or on the same day each week. While this may seem like undue emphasis on variety, in actual practice it is not difficult to carry out.

The menus presented in Table 9 were served during five consecutive days at the Merrill-Palmer School and illustrate the possible variety. That they were acceptable to the children is shown by the fact that no child returned any of the food served to him, and many took second servings. The attendance for the week averaged 37 children per day made up of a representative group, mostly between 2 and 5 years of age, including children from varied home environments.

COST

The daily cost of nursery-school meals varies considerably with the season and the type of food served and with wholesale or retail prices. At the Merrill-Palmer School the daily cost over a 20-week period from January to May, 1930, varied from 11 to 29.8 cents per child for the raw materials at wholesale prices. The average cost of raw materials over this same period was 17.0 cents per child per day. The effect of seasonal variation is shown by comparing the average cost of the January meals, 19.2 cents per child per day, with that of the May meals, which was 16.1 cents per child per day.

A record of the amount and cost of the raw materials used for each meal is kept at the school. Examples of high and low cost menus for different months are given in Table 10.

TABLE 10.—*High and low priced menus used at Merrill-Palmer School. Cost of meal per child, 1930*

Month served	High-priced menus	Cost	Low-priced menus	Cost
January	Cream of celery soup..... Baked Lima beans, tomato sauce..... Lettuce leaf..... Carrot sandwich..... Fruit cup..... Milk.....	\$0.250	Scalloped potatoes..... Buttered carrots..... Egg-yolk sandwich..... Apricot whip..... Milk.....	\$0.124
February	Liver patties..... String beans..... Carrot sandwich..... Celery..... Cream tapioca..... Milk.....	.197	Scrambled eggs..... Buttered cabbage..... Tomato and celery aspic..... Bread and butter sandwich..... Chocolate pudding..... Milk.....	.133
March	Vegetable soup..... Baked creamed spinach with egg..... Lettuce sandwich..... Rice pudding with raisins..... Milk.....	.212	Scrambled eggs..... Baked potato..... Cabbage sandwich..... Lettuce leaf..... Stewed prunes..... Milk.....	.129
April	Meat balls..... Baked sweet potato..... Creamed celery..... Baked banana, raisin sauce..... Milk.....	.223	Egg soufflé..... Buttered carrots and celery..... Cottage-cheese sandwich..... Chocolate pudding..... Milk.....	.110
May	Salmon loaf with egg sauce..... Spinach..... Carrot sandwich..... Brown Betty..... Milk.....	.187	Cream of celery soup..... Scalloped tomatoes..... Egg-yolk sandwich..... Lettuce leaf..... Apricot whip..... Milk.....	.131

Though eggs were served at the school almost every day and their price was much higher in winter than in the spring, they seemed to affect the cost of the meals less during the period under consideration than did the vegetables and fruits, and in some instances less than the meat. Calves' liver, spinach, green beans, and dried apricots and prunes all tended to bring the cost of the meals above the average.

To reduce the cost of meals in which liver is used, beef liver in loaf or patties is often substituted for broiled calves' liver. Bacon is used with the liver in making the patties or loaf in about the proportion of 1 pound of bacon to 3 pounds of beef liver. The liver is sautéed 10 minutes in part of the fat from the bacon, and the cooked bacon and liver are ground together. The loaf or patties are then made by a recipe practically the same as that used for meat loaf (p. 24), using the rest of the fat from the bacon in the mixture and baking in a slow oven without basting.

In the January-to-May period mentioned, the meals which included beef liver, served either as patties or loaf, averaged only 16.4 cents per child, less, in fact, than the average for all meals for the entire period. This would have been considerably higher if broiled calves' liver had been served. During the same months in 1928 when calves' liver was about 75 cents a pound the average cost of four meals in which broiled calves' liver was served was 28 cents per child.

The meals including fresh spinach averaged 19.9 cents per child, as compared with the general average of 17.0 cents over the same period in 1930. The spinach was out of season, which accounts for the increase in price. Since food prices naturally vary from year to year and in different parts of the country, the foods that bring the cost of the meals above the average are not always the same. Thus in 1926, when a shortage in potatoes sent the price up, the use of potatoes made a considerable difference in the cost of the nursery-school meals.

Another device for reducing the cost of food at the school is the substitution of tomato juice for orange juice. It has proved an acceptable substitute both in nutritive value and palatability. Juice from canned tomatoes, sweetened with a little sugar and flavored with cinnamon and cloves, is used. This mixture boiled together for two minutes to blend it, compares favorably in food value with orange juice as shown in Table 11, and is considerably less expensive.

TABLE 11.—*Comparison of the nutritive value and cost of orange juice and tomato juice, one-third cup of each*

Food	Protein	Fat	Carbohydrate	Fuel value	Calcium	Phosphorus	Iron	Vitamins ¹			Cost
								A	B	C	
	Gram	Gram	Grams	Calories	Gram	Gram	Gram				Cents
Orange juice ²	0.5	0.0	10.9	46	0.024	0.013	0.0002	+++	+++	+++	3.1
Prepared tomato juice ³	1.0	.2	5.6	28	.005	.012	.0003	+++	+++	+++	1.7

¹ Data are from Circular 84 (15). It is assumed that the vitamin content of the strained tomato juice, boiled for two minutes, is practically the same as that of the canned product made from the vine-ripened fruit.

² Cost calculated from medium-sized oranges at 45 cents a dozen, weight and yield of juice as on page 43.

³ Based on recipe for prepared tomato juice, page 43. Cost calculated at 18 cents for a No. 3 can.

Cost of labor must be considered in computing the total cost of food. The labor involved in the preparation of some foods is enormous. Thus, fresh spinach bought at a low price may be too expensive a food to serve a large group because of the amount of work needed to clean it. The cost of fuel must also be considered. When inexpensive foods require a long time for cooking, the final cost of the food may be little less than that of a more expensive food which requires a short cooking period. If substitutes are used to reduce the cost of a meal they should be carefully chosen so that the total food value of the meal will not be lowered.

RECIPES SHOWING CHEMICAL COMPOSITION

The actual food value in a serving of a prepared dish may vary considerably from its value as calculated from any one recipe. Differences in the quality of the raw materials, the proportions of ingredients used, the length of time of cooking, losses in preparation, and the size of the serving, all may change the final value of the serving to an appreciable extent.

It has been difficult to obtain reliable data for the calculation of food intake. A number of authorities include tables of cooked foods, but in the majority of cases the weight for each ingredient is not given, and if the measure of the ingredient is indicated, it is not always accurately stated. Generally there is no indication of the degree of dilution or concentration, and for this reason it is difficult to duplicate the recipe or to use the figures with any degree of accuracy. Also most of the recipes given by these authors have been developed without the food needs of children especially in mind, and the prepared dishes are given in terms of adult servings. It has been particularly difficult to calculate the mineral content of the food intake using the figures of these authors.

For these reasons it seems desirable to present recipes that indicate the weights and measures used in foods prepared for children. The recipes shown here give the values calculated for each ingredient, the dilution and losses in evaporation and manipulation, and the food value of the entire recipe. The estimated value of each child's serving is also given both in measure and in weight of the finished product.

In estimating the composition of the recipes, the protein, fat, and carbohydrate are calculated in nearly all cases from the figures given by Atwater and Bryant (1); constituents of fresh fruits are calculated from data in United States Department of Agriculture Circular 50 (2). The mineral content is calculated from data given by Sherman (12). Exceptions to this policy are indicated by footnote attached to the recipe in question.

No figures on minerals are available for the canned foods used in these recipes, and for two canned products data on proximate composition are also lacking. Estimates are made, however, by applying figures on percentage composition of the fresh product to the weight of drained solids or, in the case of tomatoes, to the weight of the entire contents of the can. Footnotes on the individual recipes indicate the methods of calculation in these cases. These weights are taken as an approximate measure of the amount of fresh material that went into the can. When the liquor is utilized as in these recipes, this method of calculation probably gives a fairly good estimate of the nutritive value of the canned material. The weight of drained solids as used here represents the weight of material obtained by emptying the entire contents of the can on to a large, moderately coarse sieve, about $\frac{1}{8}$ -inch mesh, leveling the contents with a fork in such a manner as to exert no pressure, and allowing to drain for a 2-minute period.

In the application of these recipes to general use it is plain that the data given here are valid only under the conditions specified. Any considerable modification of these recipes would necessitate recalculation. Careful weighing of the edible portion of the food materials used and some regulation of the various losses are necessary if these data are to be applied with any degree of accuracy.

Calculations here are based wholly on weights, and other measurements are given only as approximations. Since it may be inconvenient in daily practice at the nursery school to weigh everything, it is suggested that volume measurements may be used for certain purposes. Some food materials, especially liquids, can be measured with fair accuracy. If volume measurements are used, however, they should be checked occasionally against weights to avoid introducing serious errors into the estimates.

For further variety additional recipes may be calculated, following in general the scheme used in those presented here.

TABLE 12.—*Recipes showing chemical composition*

SOUPS

CREAM OF SPINACH SOUP

Item	Approximate measure ¹	Weight	Protein	Fat	Carbohydrate	Fuel value	Calcium	Phosphorus	Iron
		Grams	Grams	Grams	Grams	Calories	Grams	Grams	Gram
Spinach.....	4½ pounds.....	2,041	42.86	6.12	65.81	488	1.367	1.388	0.0735
Water.....	7½ cups.....	1,778							
Total.....		3,819							
Evaporation.....		428							
Total after cooking.....		3,391	42.86	6.12	65.81	488	1.367	1.388	.0735
Loss in sieving ²		113	1.43	.20	2.18	16	.046	.046	.0024
Spinach used.....		3,278	41.43	5.92	63.13	472	1.321	1.342	.0711
Milk.....	6 cups.....	1,464	48.31	55.56	73.20	1,013	1.757	1.362	.0035
Butter.....	6 tablespoons.....	85	.85	72.25		654	.013	.014	.0002
Flour.....	½ cup.....	56.5	6.33	.56	42.32	200	.011	.052	.0006
Salt.....	1½ teaspoons.....	7.5							
Total.....		4,891	96.92	137.29	178.65	2,338	3.102	2.770	.0754
Evaporation.....		119							
Total after cooking.....	19¾ cups.....	4,772	96.92	137.29	178.65	2,338	3.102	2.770	.0754
Unit measure.....	1 cup.....	240	4.9	6.9	9.0	118	.156	.139	.0038
Individual servings.....	(½ cup (39)).....	120.0	2.4	3.5	4.5	59	.078	.070	.0019
	(½ cup (59)).....	80.0	1.6	2.3	3.0	39	.052	.046	.0013

CREAM OF TOMATO SOUP

Canned tomato purée, ³ 3 No. 2 cans.....	7¼ cups.....	1,786	42.86	7.14	142.88	807	0.393	0.929	0.0143
Milk.....	7½ cups.....	1,830	60.39	73.20	91.50	1,266	2.196	1.702	.0044
Butter.....	½ cup.....	118.4	1.13	96.39		872	.017	.019	.0003
Flour.....	do.....	56.5	6.33	.56	42.32	200	.011	.052	.0006
Soda.....	2 teaspoons.....	7.5							
Total.....		3,793.4	110.71	177.29	276.70	3,145	2.617	2.702	.0195
Onions, edible portion.....		147	2.35	.44	14.55	72	.050	.066	.0009
Water.....	½ cup.....	118							
Total.....		265							
Evaporation.....		97							
Onions after cooking.....		168	2.35	.44	14.55	72	.050	.066	.0009
Loss in sieving ²		24	.34	.06	2.08	10	.007	.009	.0001
Onions used.....		144	2.01	.38	12.47	61	.043	.057	.0008
Total.....		3,937.4	112.72	177.67	289.17	3,207	2.660	2.759	.0203
Evaporation.....		195.4							
Total after cooking.....	15¼ cups.....	3,742	112.72	177.67	289.17	3,207	2.660	2.759	.0203
Unit measure.....	1 cup.....	247	7.4	11.7	19.1	212	.176	.182	.0013
Individual servings.....	(½ cup (30)).....	123.5	3.7	5.9	9.5	106	.088	.091	.0007
	(½ cup (45)).....	82.3	2.5	3.9	6.4	71	.059	.061	.0004

¹ Figures in parentheses in this column, after the measure of individual servings, refer to the numbers of servings in the entire recipe.

² Losses of nutrients in sieving are calculated on the assumption that the material lost is of the same composition as the total cooked material.

³ The composition of the purée is calculated on the basis of canned tomatoes, assuming 3,572 grams tomatoes (containing on an average 6 per cent solids) to be equivalent to 1,786 grams purée (containing 12 per cent tomato solids). Bulletin 28 figures for canned tomatoes and Sherman's mineral figures for fresh tomatoes are applied to this equivalent weight of 3,572 grams. It is assumed that the minerals in canned tomatoes are the same as in the fresh tomatoes.

TABLE 12.—*Recipes showing chemical composition*—Continued

MEATS, MACARONI, AND FISH

MEAT BALLS

Item	Approximate measure	Weight	Protein	Fat	Carbohydrate	Fuel value	Calcium	Phosphorus	Iron
		<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Calories</i>	<i>Grams</i>	<i>Grams</i>	<i>Gram</i>
Beef, round, lean, ground.	3 pounds-----	1,361	289.89	107.52	-----	2,127	0.168	3.125	0.0435
Milk-----	2 cups-----	488	16.10	19.52	24.40	335	.586	.454	.0012
Flour-----	5 tablespoons-----	36	4.03	.36	26.96	127	.007	.033	.0004
Butter-----	2 tablespoons-----	28.4	.28	24.14	-----	218	.004	.005	.0001
Bread (crumbs)*-----	5 cups-----	525	63.63	5.90	326.03	1,612	.328	1.148	.0105
Eggs-----	5-----	250	33.50	26.25	-----	370	.168	.450	.0075
Chopped onion-----	5 tablespoons-----	50	.80	.15	4.95	24	.017	.022	.0003
Salt-----	2 tablespoons-----	10	-----	-----	-----	-----	-----	-----	-----
Water-----	2 cups-----	474	-----	-----	-----	-----	-----	-----	-----
Total-----	-----	3,222.4	408.23	183.84	382.34	4,817	1.278	5.237	.0635
Evaporation-----	-----	360.4	-----	-----	-----	-----	-----	-----	-----
Total after cooking-----	-----	2,862	408.23	183.84	382.34	4,817	1.278	5.237	.0635
Individual serving-----	1 ball (56)-----	51	7.3	3.3	6.8	86	.023	.093	.0011

MEAT CASSEROLE WITH VEGETABLES

Beef, round, lean: As purchased-----	4 pounds-----	1,814	-----	-----	-----	-----	-----	-----	-----
Waste-----	-----	373	-----	-----	-----	-----	-----	-----	-----
Edible portion-----	-----	1,441	306.93	113.84	-----	2,252	0.178	3.309	0.0460
Potatoes-----	2 pounds 6 ounces-----	1,070.5	23.55	1.07	196.97	892	.150	.621	.0139
Onions-----	1 pound 7 ounces-----	659.5	10.55	1.98	65.29	321	.224	.297	.0040
Water-----	2 cups-----	474	-----	-----	-----	-----	-----	-----	-----
Broth from waste meat.*-----	-----	850	18.70	.85	-----	82	-----	-----	-----
Fat from waste meat-----	1½ tablespoons-----	19.5	-----	19.50	-----	176	-----	-----	-----
Canned peas:†-----	-----	419	-----	-----	-----	-----	-----	-----	-----
Drained solids-----	-----	177	-----	-----	-----	-----	-----	-----	-----
Liquid-----	¾ cup-----	-----	-----	-----	-----	-----	-----	-----	-----
Total-----	1 No. 2 can-----	596	21.46	1.19	58.41	330	.117	.532	.0071
Canned green beans:‡-----	-----	393	-----	-----	-----	-----	-----	-----	-----
Drained solids-----	-----	214	-----	-----	-----	-----	-----	-----	-----
Liquid-----	⅞ cup-----	-----	-----	-----	-----	-----	-----	-----	-----
Total-----	1 No. 2 can-----	607	6.68	.61	23.07	124	.181	.204	.0043
Flour-----	1 cup-----	112.5	12.60	1.12	84.26	398	.022	.104	.0011
Total before boiling-----	-----	5,830	400.47	140.16	428.00	4,575	.872	5.067	.0764
Evaporation-----	-----	933	-----	-----	-----	-----	-----	-----	-----
Total after boiling-----	-----	4,897	400.47	140.16	428.00	4,575	.872	5.067	.0764
Butter for pan-----	1 tablespoon-----	14.2	.14	12.07	-----	109	.002	.002	.0000
Total before baking-----	-----	4,911.2	400.61	152.23	428.00	4,685	.874	5.069	.0764
Evaporation-----	-----	360.2	-----	-----	-----	-----	-----	-----	-----
Total after baking-----	18¼ cups-----	4,551	400.61	152.23	428.00	4,685	.874	5.069	.0764
Unit measure-----	1 cup-----	249	21.9	8.3	23.4	256	.048	.277	.0042
Individual servings-----	1¼ cup (36)-----	124.5	11.0	4.2	11.7	128	.024	.138	.0021
	½ cup (54)-----	83.0	7.3	2.8	7.8	86	.016	.092	.0014

* The nutritive value of the bread crumbs, which were whole-wheat bread crumbs, was calculated on the basis of bread, figuring a 20 per cent weight loss from drying. Thus 525 grams of crumbs are estimated to have the food value of 656 grams of fresh bread.

† Calculated from composition of canned bouillon, carbohydrate value omitted. Calcium, phosphorus, and iron may be present in significant quantities but can not be estimated.

‡ Minerals are calculated by applying Sherman's values for the fresh vegetables to the respective weights of drained solids.

TABLE 12.—*Recipes showing chemical composition*—Continued

MEATS, MACARONI, AND FISH—Continued

MEAT LOAF

Item	Approximate measure	Weight	Protein	Fat	Carbohydrate	Fuel value	Calcium	Phosphorus	Iron
		Grams	Grams	Grams	Grams	Calories	Grams	Grams	Gram
Beef, round, lean, ground.	2½ pounds.....	1,134	241.54	89.59	-----	1,772	0.140	2.604	0.0362
Milk.....	1 cup.....	244	8.05	9.76	12.20	169	.293	.227	.0006
Flour.....	3 tablespoons.....	21.2	2.37	.21	15.88	75	.004	.020	.0002
Butter.....	1 tablespoon.....	14.2	.14	12.07	-----	109	.002	.002	.0000
Bread (crumbs).....	¾ cups.....	227	27.50	2.55	140.90	697	.142	.496	.0045
Eggs, edible portion.....	4.....	190	25.46	19.95	-----	281	.127	.342	.0057
Onions.....	1 small.....	46	.74	.14	4.55	22	.016	.021	.0003
Salt.....	1½ teaspoons.....	7.5	-----	-----	-----	-----	-----	-----	-----
Total.....	-----	1,883.9	305.80	134.27	173.53	3,126	.724	3.712	.0475
Loss in transfer.....	-----	18.9	3.07	1.35	1.74	31	.007	.037	.0005
Total used.....	2 loaves.....	1,865	302.73	132.92	171.79	3,094	.717	3.675	.0470
Water used in basting.....	2 cups.....	474	-----	-----	-----	-----	-----	-----	-----
Evaporation.....	-----	720	-----	-----	-----	-----	-----	-----	-----
Total after baking.....	-----	1,619	302.73	132.92	171.79	3,094	.717	3.675	.0470
Individual serving.....	½ slice (35) *.....	46	8.6	3.8	4.9	88	.020	.104	.0013

MACARONI, FLAVORED WITH CHEESE

Macaroni (dry).....	4 boxes.....	907	121.54	8.16	672.09	3,248	0.200	1.306	0.0109
Water.....	6½ quarts.....	6,162	-----	-----	-----	-----	-----	-----	-----
Salt.....	2 teaspoons.....	10	-----	-----	-----	-----	-----	-----	-----
Total.....	-----	7,079	-----	-----	-----	-----	-----	-----	-----
Evaporation.....	-----	1,770	-----	-----	-----	-----	-----	-----	-----
Brine poured off *.....	-----	2,108	-----	-----	-----	-----	-----	-----	-----
Macaroni (cooked and drained).	-----	3,201	121.54	8.16	672.09	3,248	.200	1.306	.0109
Milk.....	2½ quarts.....	2,440	80.52	97.60	122.00	1,688	2.928	2.269	.0059
Butter.....	½ cup.....	113.4	1.13	96.39	-----	872	.017	.019	.0002
Flour.....	1½ cups.....	150	16.80	1.50	112.35	530	.030	.138	.0015
White sauce before cooking.....	-----	2,703.4	98.45	195.49	234.35	3,091	2.975	2.426	.0076
Evaporation.....	-----	88.2	-----	-----	-----	-----	-----	-----	-----
White sauce after cooking.....	-----	2,615.2	98.45	195.49	234.35	3,091	2.975	2.426	.0076
Cheese.....	½ pound.....	226.8	65.32	81.42	.68	997	2.112	1.549	.0029
Total white sauce, cheese.....	-----	2,842	163.77	276.91	235.03	4,087	5.087	3.975	.0105
Loss in transfer.....	-----	20	1.15	1.95	1.65	29	.036	.028	.0001
White sauce and cheese used.....	-----	2,822	162.62	274.96	233.38	4,059	5.031	3.947	.0104
Total before baking.....	-----	6,023	284.16	283.12	905.47	7,307	5.251	5.253	.0213
Evaporation.....	-----	238	-----	-----	-----	-----	-----	-----	-----
Total after baking.....	23¾ cups.....	5,785	284.16	283.12	905.47	7,307	5.251	5.253	.0213
Unit measure.....	1 cup.....	247	12.1	12.1	38.7	312	.224	.224	.0009
Individual servings.....	¾ cup (46).....	123.5	6.1	6.0	19.3	156	.112	.112	.0005
	½ cup (70).....	82.3	4.0	4.0	12.9	104	.075	.075	.0003

* The nutritive value of the bread crumbs, which were whole-wheat bread crumbs, was calculated on the basis of bread, figuring a 20 per cent weight loss from drying. Thus 227 grams of crumbs are estimated to have the food value of 283.5 grams of fresh bread.

* Approximate size of half slice 2 by 2½ by ½ inches.

* It is assumed that no nutrients are lost in the brine.

TABLE 12.—*Recipes showing chemical composition—Continued*

MEATS, MACARONI, AND FISH—Continued

CREAMED HALIBUT

Item	Approximate measure	Weight	Protein	Fat	Carbohydrate	Fuel value	Calcium	Phosphorus	Iron
		<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Calories</i>	<i>Grams</i>	<i>Grams</i>	<i>Gram</i>
Halibut:									
As purchased.....	6 pounds 1 ounce..	2,758							
Bones, etc.....		178							
Edible portion ¹⁰		2,580	479.88	134.16		3,127	0.523	5.509	0.0264
Milk.....	2½ quarts.....	2,440	80.52	97.60	122.00	1,688	2.928	2.269	.0059
Flour.....	2¾ cups.....	300	33.60	3.00	224.70	1,060	.060	.276	.0030
Butter.....	¾ cup.....	170.1	1.70	144.59		1,308	.026	.029	.0003
Salt.....	1 teaspoon.....	5							
Total.....		5,495.1	595.70	379.35	346.70	7,184	3.537	8.083	.0356
Evaporation.....		659.1							
Total after cooking.....	19¼ cups.....	4,836	595.70	379.35	346.70	7,184	3.537	8.083	.0356
Unit measure.....	1 cup.....	251	30.9	19.7	18.0	373	.184	.420	.0018
Individual servings.....	½ cup (38).....	125.5	15.5	9.8	9.0	186	.092	.210	.0009
	½ cup (57).....	83.7	10.3	6.6	6.0	124	.061	.140	.0006

EGGS

BAKED EGGS

Eggs:									
As purchased.....	3 dozen.....	2,028.5							
Shells.....		235							
Edible portion.....		1,743.5	233.63	183.07		2,582	1.168	3.138	0.0523
Gain in weight.....		27							
Eggs (after boiling).....		1,770.5	233.63	183.07		2,582	1.168	3.138	.0523
Milk.....	2½ quarts.....	2,440	80.52	97.60	122.00	1,688	2.923	2.269	.0059
Flour.....	2 cups.....	225	25.20	2.25	168.53	795	.045	.207	.0023
Butter.....	¾ cup.....	170.1	1.70	144.59		1,308	.026	.029	.0003
Salt.....	1 teaspoon.....	5							
Total white sauce.....		2,840.1	107.42	244.44	290.53	3,792	2.999	2.505	.0085
Evaporation.....		170.1							
White sauce after cooking.....		2,670							
Loss in transfer.....		57	2.29	5.22	6.20	81	.064	.053	.0002
White sauce used.....		2,613	105.13	239.22	284.33	3,711	2.935	2.452	.0083
Butter for pan.....	1 tablespoon.....	14.2	.14	12.07		109	.002	.002	.0000
Total before baking.....		4,397.7	338.90	434.36	284.33	6,402	4.105	5.592	.0606
Evaporation.....		175.7							
Total after baking.....	17 cups.....	4,222	338.90	434.36	284.33	6,402	4.105	5.592	.0606
Unit measure.....	1 cup.....	247	19.8	25.4	16.6	375	.240	.327	.0035
Individual servings.....	½ cup (34).....	123.5	9.9	12.7	8.3	187	.120	.164	.0018
	½ cup (51).....	82.8	6.6	8.5	5.5	125	.080	.109	.0012

¹⁰ Finely shredded and cooked with milk.

TABLE 12.—*Recipes showing chemical composition*—Continued

EGGS—Continued

CREAMED EGGS ON TOAST CUBES

Item	Approximate measure	Weight	Protein	Fat	Carbohydrate	Fuel value	Calcium	Phosphorus	Iron
Eggs:		<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Calories</i>	<i>Grams</i>	<i>Grams</i>	<i>Gram</i>
As purchased.....	4 dozen.....	2,554							
Shells.....		294							
Edible portion.....		2,260							
Milk.....	2½ quarts.....	2,440	80.52	97.60	122.00	1,688	2.928	2.269	0.0059
Flour.....	2 cups.....	225	25.20	2.25	168.52	795	.045	.207	.0022
Butter.....	¾ cup.....	170.1	1.70	144.59		1,308	.026	.029	.0003
Salt.....	1 teaspoon.....	5							
White sauce before cooking.....		2,840.1	107.42	244.44	290.52	3,792	2.999	2.505	.0084
Evaporation.....		107.1							
White sauce after cooking.....		2,733	107.42	244.44	290.52	3,792	2.999	2.505	.0084
Egg whites, boiled.....		1,335	164.20	2.67		681	.200	.187	.0013
White sauce and egg whites.....	16½ cups.....	4,068	271.62	247.11	290.52	4,473	3.199	2.692	.0097
Unit measure.....	1 cup.....	248	16.56	15.06	17.71	273	.195	.164	.0006
Egg yolks, boiled.....		925							
Loss in sieving.....		20							
Egg yolks used.....		905	142.08	301.36		3,281	.240	.742	.0778
Individual serving:									
Creamed egg.....	¾ cup (48).....	82.7	5.5	5.0	5.9	91	.065	.055	.0002
Egg yolk.....	2¾ tablespoons (48).....	18.8	3.0	6.3		69	.026	.098	.0016
Toast cubes ¹¹	4.....	5.7	.7	.1	3.7	18	.004	.013	.0001
Total.....		107.2	9.2	11.4	9.6	178	.095	.166	.0019

POACHED EGGS ON TOAST CUBES ¹¹

Eggs:									
As purchased.....	25.....	1,471							
Shells.....		184							
Edible portion.....		1,287	172.46	135.14		1,906	0.862	2.317	0.0386
Loss of cooked egg ¹²		52	6.40	.10		26	.008	.007	.0001
Gain in weight.....		25							
Total after cooking.....	25.....	1,260	166.06	135.04		1,880	.854	2.310	.0385
Individual serving:									
Poached egg.....	1 (25).....	50.4	6.6	5.4		75	.034	.092	.0015
Toast cubes.....	4 ¹³	5.7	.7	.1	3.7	18	.004	.013	.0001
Total.....	(25).....	56.1	7.4	5.5	3.7	93	.038	.105	.0016

¹¹ Made from whole-wheat bread, p. 36.¹² Calculations based on Bulletin 28 figures for egg white (I).¹³ Four toasted cubes of whole-wheat bread, from p. 36.

TABLE 12.—*Recipes showing chemical composition—Continued*

EGGS—Continued

EGG SOUFFLÉ

Item	Approximate measure	Weight	Protein	Fat	Carbohydrate	Fuel value	Calcium	Phosphorus	Iron
		<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Calories</i>	<i>Grams</i>	<i>Grams</i>	<i>Gram</i>
Eggs:									
As purchased	20	1,156							
Shells		156							
Edible portion		1,000							
Milk	6 cups	1,464	48.31	58.56	73.20	1,013	1.757	1.362	0.0035
Flour	2 cups	225	25.20	2.25	163.52	795	.045	.207	.0022
Butter	10 tablespoons	141.8	1.42	120.53		1,090	.021	.024	.0003
Salt	1 teaspoon	7.5							
Total		1,838.3	74.93	181.34	241.72	2,899	1.823	1.593	.0050
Evaporation		73.3							
Total after cooking		1,765	74.93	181.34	241.72	2,899	1.823	1.593	.0060
Loss in transfer		15	.64	1.54	2.05	25	.015	.014	.0001
White sauce used		1,750	74.29	179.80	239.67	2,874	1.808	1.579	.0059
Egg yolks	20	440	69.03	146.52		1,595	.603	2.306	.0378
Total		2,190	143.37	326.32	239.67	4,469	2.411	3.885	.0437
Egg whites	20	560							
Loss in manipulation		7							
Whites used		553	68.02	1.11		282	.083	.077	.0006
Total in mixing dish		2,743	211.39	327.43	239.67	4,751	2.494	3.962	.0443
Loss in transfer		29.8	2.30	3.56	2.60	52	.027	.043	.0005
Total after transfer		2,713.2	209.09	323.87	237.07	4,699	2.467	3.919	.0438
Butter for pan	1 tablespoon	14.2	.14	12.07		109	.002	.002	.0000
Total before baking		2,727.4	209.23	335.94	237.07	4,809	2.469	3.921	.0438
Evaporation		439.4							
Total after baking		2,288	209.23	335.94	237.07	4,809	2.469	3.921	.0438
Individual serving	2 by 2 by 1½ inches (52)	44	4.0	6.5	4.6	92	.047	.075	.0008

SCRAMBLED EGGS

Eggs:									
As purchased	39	2,228							
Shells		313							
Edible portion	39	1,915	256.61	201.08		2,836	1.283	3.447	0.0574
Butter	9 tablespoons	127.6	1.28	108.46		981	.019	.022	.0003
Flour	½ cup	56.5	6.33	.56	42.32	200	.011	.052	.0006
Milk	4 cups	976	32.21	39.04	48.80	675	1.171	.908	.0023
Salt	1 teaspoon	5							
Total		3,080.1	296.43	349.14	91.12	4,692	2.484	4.429	.0606
Evaporation		258.1							
Total after cooking	11½ cups	2,822	296.43	349.14	91.12	4,692	2.484	4.429	.0606
Unit measure	1 cup	245	25.7	30.3	7.9	407	.216	.385	.0053
Individual servings	½ cup (23)	122.5	12.9	15.2	4.0	204	.108	.192	.0026
	¼ cup (34)	81.7	8.6	10.1	2.6	136	.072	.128	.0018

TABLE 12.—*Recipes showing chemical composition—Continued*

EGGS—Continued

SCRAMBLED EGGS IN TOMATO SAUCE

Item	Approximate measure	Weight	Protein	Fat	Carbohydrate	Fuel value	Calcium	Phosphorus	Iron
		<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Calories</i>	<i>Grams</i>	<i>Grams</i>	<i>Gram</i>
Canned tomato purée. ¹⁴	1 No. 10 can (11¾ cups).	2,910	69.84	11.64	232.80	1,315	0.640	1.513	0.0233
Flour.....	2 cups.....	225	25.20	2.25	168.53	795	.045	.207	.0022
Butter.....	¾ cup.....	170.1	1.70	144.59	-----	1,308	.026	.029	.0003
Eggs, edible portion	38 eggs.....	1,885	252.59	197.93	-----	2,792	1.263	3.393	.0560
Total ¹⁵	-----	5,190.1	349.33	356.41	401.33	6,210	1.974	5.142	.0824
Evaporation.....	-----	383.1	-----	-----	-----	-----	-----	-----	-----
Total after cooking.	19¾ cups.....	4,807	349.33	356.41	401.33	6,210	1.974	5.142	.0824
Unit measure.....	1 cup.....	250	18.2	18.5	20.9	323	.103	.267	.0043
Individual servings.....	½ cup (38).....	125.0	9.1	9.3	10.4	162	.052	.134	.0021
	¾ cup (57).....	83.3	6.1	6.2	7.0	108	.034	.089	.0014

VEGETABLES

BUTTERED ASPARAGUS

Canned asparagus: ¹⁶									
Stalks.....	243.....	1,775	-----	-----	-----	-----	-----	-----	-----
Liquid.....	2¾ cups.....	672	-----	-----	-----	-----	-----	-----	-----
Total.....	5 No. 1 cans.....	2,447	36.70	2.45	68.52	443	0.444	0.692	0.0178
Butter.....	½ cup.....	113.4	1.13	96.39	-----	872	.017	.019	.0002
Total.....	-----	2,560.4	37.83	98.84	68.52	1,315	.461	.711	.0180
Evaporation.....	-----	430.4	-----	-----	-----	-----	-----	-----	-----
Total after cooking.	-----	2,130	37.83	98.84	68.52	1,315	.461	.711	.0180
Individual serving:									
Stalks.....	5 (49).....	-----	-----	-----	-----	-----	-----	-----	-----
Liquid.....	1½ teaspoons (49).....	-----	-----	-----	-----	-----	-----	-----	-----
Total.....	-----	43	.8	2.0	1.4	27	.009	.014	.0004

CREAMED ASPARAGUS

Canned asparagus: ¹⁶									
Stalks.....	243.....	1,775	-----	-----	-----	-----	-----	-----	-----
Liquid.....	2¾ cups.....	672	-----	-----	-----	-----	-----	-----	-----
Total.....	5 No. 1 cans.....	2,447	36.71	2.45	68.52	443	0.444	0.692	0.0178
Milk.....	5¼ cups.....	1,281	42.27	51.24	64.05	886	1.537	1.191	.0031
Flour.....	1¾ cups.....	200	22.40	2.00	149.80	707	.040	.184	.0020
Butter.....	10 tablespoons.....	141.8	1.42	120.53	-----	1,090	.021	.024	.0003
Salt.....	1 teaspoon.....	5	-----	-----	-----	-----	-----	-----	-----
Total.....	-----	4,074.8	102.80	176.22	282.37	3,127	2.042	2.091	.0232
Evaporation.....	-----	232.8	-----	-----	-----	-----	-----	-----	-----
Total after cooking.	15¾ cups.....	3,842	102.80	176.22	282.37	3,127	2.042	2.091	.0232
Unit measure.....	1 cup.....	249	6.7	11.4	18.3	203	.132	.136	.0015
Individual servings.....	½ cup (30).....	124.5	3.3	5.7	9.2	101	.066	.068	.0008
	¾ cup (46).....	83.0	2.2	3.8	6.1	68	.044	.045	.0005

¹⁴ The composition of the purée is calculated on the basis of canned tomatoes, assuming 5,820 grams tomatoes (containing on an average 6 per cent solids) to be equivalent to 2,910 grams purée (containing 12 per cent tomato solids). Bulletin 28 figures for canned tomatoes and Sherman's mineral figures for fresh tomatoes are applied to this equivalent weight of 5,820 grams.

¹⁵ Eggs are cooked in sauce made of tomato purée, flour, and butter.

¹⁶ Minerals are calculated on the basis of drained solids, applying Sherman's percentages for minerals in fresh asparagus.

TABLE 12.—*Recipes showing chemical composition—Continued*

VEGETABLES—Continued

BUTTERED GREEN BEANS

Item	Approximate measure	Weight	Protein	Fat	Carbohydrate	Fuel value	Calcium	Phosphorus	Iron
Beans (fresh):		<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Calories</i>	<i>Grams</i>	<i>Grams</i>	<i>Gram</i>
As purchased		5,886							
Waste		2,115							
Edible portion		3,771	86.73	11.31	279.05	1,565	1.735	1.961	0.0415
Water	7½ cups	1,778							
Butter	1½ cups	340	3.40	289.00		2,615	.051	.058	.0007
Salt	3 teaspoons	15							
Total		5,904	90.13	300.31	279.05	4,180	1.786	2.019	.0422
Evaporation		1,533							
Total after cooking	19 cups	4,371	90.13	300.31	279.05	4,180	1.786	2.019	.0422
Unit measure	1 cup	230	4.7	15.8	14.7	220	.094	.106	.0022
Individual servings	½ cup (38)	115.0	2.4	7.9	7.3	110	.047	.053	.0011
	⅓ cup (57)	76.7	1.6	5.3	4.9	73	.031	.035	.0007

BUTTERED BEETS

Canned beets: ¹⁷									
Drained solids		2,745							
Liquid	5½ cups	1,328							
Total	4 No. 3 cans	4,073	43.92	2.74	266.26	1,265	0.796	1.071	0.0165
Butter	½ cup	113.4	1.13	96.39		872	.017	.019	.0002
Total		4,186.4	45.05	99.13	266.26	2,137	.813	1.090	.0167
Evaporation		669.4							
Total after cooking	15 cups	3,517	45.05	99.13	266.26	2,137	.813	1.090	.0167
Unit measure	1 cup	235	3.0	6.6	17.8	143	.054	.073	.0011
Individual servings	½ cup (30)	117.5	1.5	3.3	8.9	71	.027	.036	.0006
	⅓ cup (45)	78.3	1.0	2.2	5.9	48	.018	.024	.0004

BUTTERED CABBAGE

Cabbage:									
As purchased	10 pounds	4,536							
Waste		530							
Edible portion		4,006	64.10	12.02	224.34	1,262	1.803	1.162	0.0441
Water	13½ cups	3,200							
Salt	4 teaspoons	20							
Butter	1 cup	227	2.27	192.95		1,746	.034	.039	.0005
Total		7,453	66.37	204.97	224.34	3,008	1.837	1.201	.0446
Evaporation		3,206							
Total after cooking	17¾ cups	4,247	66.37	204.97	224.34	3,008	1.837	1.201	.0446
Unit measure	1 cup	240	3.8	11.6	12.7	170	.104	.068	.0025
Individual servings	½ cup (35)	120.0	1.9	5.8	6.3	85	.052	.034	.0013
	⅓ cup (53)	80.0	1.2	3.9	4.2	57	.035	.023	.0009

¹⁷ Protein, fat, carbohydrate, and minerals all calculated on the weight of drained solids, applying the figures for fresh beets in the case of both proximate constituents and minerals.

TABLE 12.—*Recipes showing chemical composition*—Continued

VEGETABLES—Continued

CREAMED CABBAGE

Item	Approximate measure	Weight	Protein	Fat	Carbohydrate	Fuel value	Calcium	Phosphorus	Iron
		<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Calories</i>	<i>Grams</i>	<i>Grams</i>	<i>Gram</i>
Cabbage:									
As purchased.....	4 pounds 6 ounces.....	1,984							
Waste.....		510							
Edible portion (finely cut).	12 cups.....	1,474	23.58	4.42	82.54	464	0.663	0.427	0.0162
Milk.....	2 quarts.....	1,952	64.42	78.08	97.60	1,351	2.342	1.815	.0047
Flour.....	1½ cups.....	150	16.80	1.50	112.35	530	.030	.138	.0015
Butter.....	10 tablespoons.....	141.8	1.42	120.53		1,090	.021	.024	.0003
Salt.....	1 teaspoon.....	5							
Total.....		3,722.8	106.22	204.53	292.49	3,436	3.056	2.404	.0227
Evaporation.....		349.8							
Total after cooking.	13¾ cups.....	3,373	106.22	204.53	292.49	3,436	3.056	2.404	.0227
Unit measure.....	1 cup.....	245	7.7	14.9	21.2	250	.222	.175	.0016
Individual servings..	(½ cup (27).....	122.5	3.9	7.4	10.6	125	.111	.088	.0008
	(½ cup (41).....	81.7	2.6	5.0	7.1	83	.074	.058	.0005

BUTTERED CARROTS

Carrots:									
As purchased.....	8 pounds.....	3,629							
Waste.....		439							
Edible portion.....		3,190	35.09	12.76	296.67	1,442	1.786	1.467	0.0191
Water.....	5¼ cups.....	1,264							
Butter.....	1 cup.....	227	2.27	192.95		1,746	.034	.039	.0005
Salt.....	2 teaspoons.....	10							
Total.....		4,691	37.36	205.71	296.67	3,188	1.820	1.506	.0196
Evaporation.....		863							
Total after cooking.	16½ cups.....	3,828	37.36	205.71	296.67	3,188	1.820	1.506	.0196
Unit measure.....	1 cup.....	231	2.3	12.4	17.9	192	.110	.091	.0012
Individual servings..	(½ cup (33).....	115.5	1.1	6.2	9.0	96	.055	.046	.0006
	(½ cup (49).....	77.0	.8	4.1	6.0	64	.037	.030	.0004

BUTTERED CARROTS AND CELERY

Celery:									
As purchased.....	6 bunches.....	1,365							
Waste.....		360							
Edible portion.....		1,005	11.06	1.00	33.16	186	0.784	0.372	0.0050
Carrots:									
As purchased.....	4½ pounds.....	2,041							
Waste.....		339							
Edible portion.....		1,702	18.72	6.81	158.29	769	.953	.783	.0102
Butter.....	¾ cup.....	170.1	1.70	144.58		1,308	.026	.029	.0003
Salt.....	1½ teaspoons.....	7.5							
Water.....	5¼ cups.....	1,244							
Total.....		4,128.6	31.48	152.39	191.45	2,263	1.763	1.184	.0155
Evaporation.....		896.6							
Total after cooking.	14¼ cups.....	3,232	31.48	152.39	191.45	2,263	1.763	1.184	.0155
Unit measure.....	1 cup.....	228	2.2	10.7	13.5	160	.124	.084	.0011
Individual servings..	(½ cup (28).....	114.0	1.1	5.4	6.8	80	.062	.042	.0005
	(½ cup (42).....	76.0	.7	3.6	4.5	53	.041	.028	.0004

TABLE 12.—*Recipes showing chemical composition—Continued*

VEGETABLES—Continued

BUTTERED CARROTS AND PEAS

Item	Approximate measure	Weight	Protein	Fat	Carbohydrate	Fuel value	Calcium	Phosphorus	Iron
		<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Calories</i>	<i>Grams</i>	<i>Grams</i>	<i>Gram</i>
Carrots:									
As purchased.....	2½ pounds.....	1,134							
Waste.....	.....	120							
Edible portion.....	8 cups.....	1,014	11.15	4.06	94.30	458	0.568	0.466	0.0061
Canned peas: ¹⁸									
Drained solids.....	.....	1,515							
Liquid.....	3½ cups.....	815							
Total.....	4 No. 2 cans.....	2,330	83.88	4.66	228.34	1,291	.424	1.924	.0258
Water.....	2 cups.....	474							
Butter.....	½ cup.....	113.4	1.13	96.39		872	.017	.019	.0002
Total.....	.....	3,931.4	96.16	105.11	322.64	2,621	1.009	2.409	.0321
Evaporation.....	.....	891.4							
Total after cooking.....	12¾ cups.....	3,040	96.16	105.11	322.64	2,621	1.009	2.409	.0321
Unit measure.....	1 cup.....	237	7.5	8.2	25.2	204	.079	.188	.0025
Individual servings.....	½ cup (25).....	118.5	3.8	4.1	12.6	102	.040	.094	.0013
	¼ cup (38).....	79.0	2.5	2.7	8.4	68	.026	.063	.0008

CELERY

Celery: Individual serving.....	½ stalk.....	6	0.1	0.0	0.2	1	0.005	0.002	0.0000
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CREAMED ONIONS

Onions:									
As purchased.....	6½ pounds.....	2,950							
Waste.....		174							
Edible portion.....		2,776	44.42	8.33	274.82	1,352	0.944	1.249	0.0167
Water.....	4½ cups.....	1,027							
Total.....	.....	3,803							
Evaporation.....	.....	1,490							
Onions after cooking.....	.....	2,313							
Loss in sieving ².....	.....	462	8.87	1.66	54.88	270	.189	.249	.0033
Onions used.....	.....	1,851	35.55	6.67	219.94	1,082	.755	1.000	.0134
Milk.....	6 cups.....	1,464	48.31	58.56	73.20	1,013	1.757	1.362	.0035
Flour.....	1½ cups.....	150	16.80	1.50	112.35	530	.030	.138	.0015
Butter.....	½ cup.....	113.4	1.13	96.39		872	.017	.019	.0002
Salt.....	1 teaspoon.....	5							
Total.....	.....	3,583.4	101.79	163.12	405.49	3,497	2.559	2.519	.0186
Evaporation.....	.....	252.4							
Total after cooking.....	13½ cups.....	3,331	101.79	163.12	405.49	3,497	2.559	2.519	.0186
Unit measure.....	1 cup.....	245	7.5	12.0	29.8	257	.188	.185	.0014
Individual servings.....	½ cup (27).....	22.5	3.7	6.0	14.9	129	.094	.092	.0007
	¼ cup (40).....	81.7	2.5	4.0	9.9	86	.063	.062	.0005

² Losses of nutrients in sieving are calculated on the assumption that the material lost is of the same composition as the total cooked material.¹⁸ Minerals are calculated from the weight of drained solids, applying Sherman's figures for fresh peas.

TABLE 12.—*Recipes showing chemical composition—Continued*

VEGETABLES—Continued

BUTTERED PEAS

Item	Approximate measure	Weight	Protein	Fat	Carbohy- drate	Fuel value	Cal- cium	Phos- phorus	Iron
		<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Calo- ries</i>	<i>Grams</i>	<i>Grams</i>	<i>Gram</i>
Canned peas: ¹⁸									
Drained solids.....		2,296							
Liquid.....	5¾ cups.....	1,291							
Total.....	6 No. 2 cans.....	3,587	129.13	7.17	351.53	1,987	0.643	2.916	0.0390
Butter.....	½ cup.....	113.4	1.13	96.39		872	.017	.019	.0002
Total.....		3,700.4	130.26	103.56	351.53	2,859	.660	2.935	.0392
Evaporation.....		666.4							
Total after cooking.....	12¼ cups.....	3,034	130.26	103.56	351.53	2,859	.660	2.935	.0392
Unit measure.....	1 cup.....	250	10.7	8.5	29.0	236	.054	.242	.0032
Individual servings.....	½ cup (24).....	125.0	5.4	4.3	14.5	118	.027	.121	.0016
	½ cup (36).....	83.3	3.6	2.8	9.7	79	.018	.081	.0011

BAKED POTATOES

Potatoes, as pur- chased.....	30 small.....	¹⁹ 3,696	66.53	3.70	543.31	2,473	0.414	1.715	.0384
Evaporation.....		554							
Total after baking.....		3,142	66.53	3.70	543.31	2,473	.414	1.715	.0384
Individual serving:									
Potato.....	1.....	105	2.2	.1	18.2	83	.014	.057	.0013
Butter.....		1	.0	.8		8	.090	.000	.0000
Total.....		106	2.2	1.0	18.2	90	.014	.057	.0013

CREAMED POTATOES

Potatoes.....	6 pounds.....	2,722							
Loss in weight.....		3							
Potatoes cooked in jackets.....		2,719							
Skins.....		405							
Potatoes, cooked and peeled. ²⁰		2,314	50.91	2.31	425.78	1,928	0.324	1.342	0.0301
Milk.....	2 quarts.....	1,952	64.42	78.08	97.60	1,351	2.342	1.815	.0047
Butter.....	½ cup.....	113.4	1.13	96.39		872	.017	.019	.0002
Flour.....	1½ cups.....	150	16.80	1.50	112.35	530	.030	.138	.0015
Salt.....	1 teaspoon.....	5							
Total.....		4,534.4	133.26	178.28	635.73	4,680	2.713	3.314	.0365
Evaporation.....		208.4							
Total after cooking.....	17¼ cups.....	4,326	133.26	178.28	635.73	4,680	2.713	3.314	.0365
Unit measure.....	1 cup.....	249	7.7	10.3	36.6	269	.156	.191	.0021
Individual servings.....	½ cup (34).....	124.5	3.8	5.1	18.3	135	.078	.096	.0010
	½ cup (52).....	83.0	2.6	3.4	12.2	90	.052	.064	.0007

¹⁸ Minerals are calculated from the weight of drained solids, applying Sherman's figures for fresh peas.¹⁹ This weight includes skins although they are considered inedible. Minerals, therefore, are calculated from the weight of the edible portion, 2,957 grams, assuming the waste skins to represent 20 per cent of the as-purchased weight. Proximate constituents are calculated on the basis of as-purchased figures from Bulletin 28 (1).²⁰ Data on percentage composition of fresh potatoes have been applied to weight of cooked, peeled potatoes (2,314 grams), assuming that the losses of nutrients in cooking are negligible.

TABLE 12.—*Recipes showing chemical composition—Continued*

VEGETABLES—Continued

MASHED POTATOES

Item	Approximate measure	Weight	Protein	Fat	Carbohydrate	Fuel value	Calcium	Phosphorus	Iron
Potatoes:		<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Calories</i>	<i>Grams</i>	<i>Grams</i>	<i>Gram</i>
As purchased	12 pounds	3,443							
Waste		1,513							
Edible portion		3,930	86.46	3.93	723.12	3,274	0.550	2.279	0.0511
Water	6¼ cups	1,481							
Salt	1 teaspoon	5							
Total		5,416	86.46	3.93	723.12	3,274	.550	2.279	.0511
Evaporation		1,284							
Total after cooking. ²¹		4,132	86.46	3.93	723.12	3,274	.550	2.279	.0511
Butter	¾ cup	170.1	1.70	144.58		1,308	.026	.029	.0003
Milk	2 cups	488	16.10	19.52	24.40	338	.586	.454	.0012
Evaporation ²²		20.1							
Total after mashing. ²³	21 cups	4,770	104.26	168.03	747.52	4,919	1.162	2.762	.0526
Unit measure	1 cup	226	4.9	8.0	35.4	233	.055	.131	.0025
Individual servings	½ cup (42)	113.0	2.5	4.0	17.7	117	.028	.066	.0012
	¼ cup (63)	75.3	1.6	2.7	11.8	78	.018	.044	.0008

SCALLOPED POTATOES

Potatoes:									
As purchased	8 pounds	3,628.8							
Waste		836.8							
Edible portion		2,792	61.42	2.79	513.73	2,326	0.391	1.619	0.0393
Butter	10½ tablespoons	148.9	1.49	126.56		1,145	.022	.025	.0003
Flour	2¾ cups	300	33.60	3.00	224.70	1,060	.060	.276	.0030
Milk	3¾ quarts	3,579	118.11	143.16	178.95	2,477	4.295	3.328	.0086
Salt	1 tablespoon	15							
Butter for pan	1½ tablespoons	21.3	.21	18.10		164	.003	.004	.0000
Total		6,856.2	214.83	293.61	917.38	7,171	4.771	5.252	.0482
Evaporation		1,084.2							
Total after baking	23 cups	5,772	214.83	293.61	917.38	7,171	4.771	5.252	.0482
Unit measure	1 cup	250	9.3	12.7	39.7	311	.207	.227	.0021
Individual servings	½ cup (46)	125.0	4.6	6.4	19.9	155	.104	.114	.0010
	¼ cup (69)	83.3	3.1	4.2	13.2	104	.069	.076	.0007

BAKED SWEET POTATOES

Sweetpotatoes, as purchased	34 small	24 3,386	47.40	20.32	741.53	3,339	0.515	1.219	0.0135
Butter for outside ²⁴	2 tablespoons	28.4							
Total		3,414.4							
Evaporation		458.4							
Total after baking		2,956	47.40	20.32	741.53	3,339	.515	1.219	.0135
Individual serving:									
Sweetpotato	1	87	1.4	.6	21.8	98	.015	.036	.0004
Butter		1	.0	.8		8	.000	.000	.0000
Total		88	1.4	1.4	21.8	106	.015	.036	.0004

²¹ No water poured off.²² Evaporation during mashing and beating.²³ Potatoes mashed and beaten until light.²⁴ This weight includes skins, although they are considered inedible. Minerals, therefore, are calculated from the weight of the edible portion, 2,709 grams, assuming the waste skins to represent 20 per cent of the as-purchased weight. Proximate constituents are calculated on the basis of as-purchased figures from Bulletin 28 (1).²⁵ Constituents not reported, as butter is put on outside and the skins are considered inedible.

TABLE 12.—*Recipes showing chemical composition—Continued*

VEGETABLES—Continued

RICE WITH TOMATOES

Item	Approximate measure	Weight	Protein	Fat	Carbohydrate	Fuel value	Calcium	Phosphorus	Iron
		<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Calories</i>	<i>Grams</i>	<i>Grams</i>	<i>Grams</i>
Rice (brown) ²⁶	3 cups.....	606	48.48	1.82	478.74	2,125	0.055	1.254	0.0121
Water.....	4 cups.....	948							
Canned tomatoes ²⁷	3 No. 3 cans (12 cups).....	2,926	35.11	5.85	117.04	661	.322	.761	.0117
Salt.....	1 teaspoon.....	5							
Butter.....	10 tablespoons.....	141.8	1.42	120.53		1,090	.021	.024	.0003
Total.....		4,626.8	85.01	128.20	595.78	3,877	.398	2.039	.0241
Evaporation.....		554.8							
Total after cooking.....	16¾ cups.....	4,072	85.01	128.20	595.78	3,877	.398	2.039	.0241
Unit measure.....	1 cup.....	250	5.2	7.9	36.6	238	.024	.125	.0015
Individual servings.....	½ cup (32).....	125.0	2.6	3.9	18.3	119	.012	.062	.0007
	¼ cup (48).....	83.3	1.7	2.6	12.2	79	.008	.042	.0005

BUTTERED SPINACH

Canned spinach ²⁸									
Drained solids.....		2,349							
Liquid.....	4¾ cups.....	1,007							
Total.....	4 No. 2½ cans.....	3,356	54.81	7.83	83.52	624	1.749	1.775	0.0940
Butter.....	½ cup.....	113.4	1.13	96.39		872	.017	.019	.0002
Flour.....	1½ cups.....	150	16.80	1.50	112.35	530	.030	.138	.0015
Total.....		3,619.4	72.74	105.72	195.87	2,026	1.796	1.932	.0957
Evaporation.....		210.4							
Total after cooking.....	13¾ cups.....	3,409	72.74	105.72	195.87	2,026	1.796	1.932	.0957
Unit measure.....	1 cup.....	248	5.3	7.7	14.2	147	.131	.141	.0070
Individual servings.....	½ cup (27).....	124.0	2.6	3.8	7.1	74	.066	.070	.0035
	¼ cup (41).....	82.7	1.8	2.6	4.7	49	.044	.047	.0023

CREAMED SPINACH

Canned spinach ²⁹									
Drained solids.....		1,756							
Liquid.....	3¾ cups.....	752							
Total.....	3 No. 2½ cans.....	2,508	40.97	5.85	62.43	466	1.307	1.327	0.0702
Milk.....	7½ cups.....	1,830	60.39	73.20	91.50	1,266	2.196	1.702	.0044
Butter.....	9 tablespoons.....	127.6	1.28	108.46		981	.019	.022	.0003
Flour.....	2 cups.....	225	25.20	2.25	168.52	795	.045	.207	.0022
Total.....		4,690.6	127.84	189.76	322.45	3,509	3.567	3.258	.0771
Evaporation.....		227.6							
Total after cooking.....	18 cups.....	4,463	127.84	189.76	322.45	3,509	3.567	3.258	.0771
Unit measure.....	1 cup.....	248	7.1	10.5	17.9	195	.198	.181	.0043
Individual servings.....	½ cup (36).....	124.0	3.6	5.3	9.0	97	.099	.090	.0021
	¼ cup (54).....	82.7	2.4	3.6	6.0	65	.066	.060	.0014

²⁶ Proximate composition and calcium are calculated on the basis of figures for white rice; phosphorus and iron are calculated from figures for brown rice.

²⁷ Sherman's values for mineral constituents in fresh tomatoes are applied to the weight of canned tomatoes.

²⁸ It is assumed that 2,610 grams of fresh spinach were used in preparing this quantity since drained solids in spinach are assumed to represent nine-tenths of the fresh weight. Calculations of all nutrients are based on this assumption.

²⁹ It is assumed that 1,951 grams fresh spinach were used in preparing the canned product since drained solids in spinach are assumed to represent nine-tenths of the fresh weight. Calculations of all nutrients are based on this assumption.

TABLE 12.—*Recipes showing chemical composition—Continued*

VEGETABLES—Continued

STEWED TOMATOES WITH TOAST CUBES

Item	Approximate measure	Weight	Protein	Fat	Carbohydrate	Fuel value	Calcium	Phosphorus	Iron
		<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Calories</i>	<i>Gram</i>	<i>Grams</i>	<i>Gram</i>
Canned tomatoes ²⁷ ...	4 No. 3 cans (16 cups).....	3,871	46.45	7.74	154.84	875	0.426	1.006	0.0155
Butter.....	½ cup.....	113.4	1.13	96.39	-----	872	.017	.019	.0002
Toast cubes ²⁸	-----	456	57.72	5.30	295.72	1,462	.298	1.041	.0095
Total.....	-----	4,440.4	105.36	109.49	450.56	3,209	.741	2.066	.0252
Evaporation.....	-----	219.4	-----	-----	-----	-----	-----	-----	-----
Total after cooking.	17 cups.....	4,221	105.30	109.49	450.56	3,209	.741	2.066	.0252
Unit measure.....	1 cup.....	246	6.1	6.4	26.3	187	.043	.120	.0015
Individual servings...	½ cup (34).....	123.0	3.1	3.2	13.1	94	.022	.060	.0007
	⅓ cup (51).....	82.0	2.0	2.1	8.8	62	.014	.040	.0005

SANDWICHES AND TOAST

CABBAGE SANDWICHES (WHOLE WHEAT)

Bread, whole-wheat	28 slices ²¹	784	76.05	7.06	389.65	1,926	0.392	1.372	0.0125
Butter.....	4 tablespoons.....	56.7	.57	48.20	-----	436	.009	.010	.0001
Cabbage ²²	1½ cups.....	184	2.94	.55	10.30	58	.083	.053	.0020
Total.....	-----	1,024.7	79.56	55.81	399.95	2,420	.484	1.435	.0146
Individual serving...	1 sandwich of one-half slice bread (56).....	18.3	1.4	1.0	7.1	43	.009	.026	.0003

CELERY SANDWICHES (WHOLE WHEAT)

Bread, whole-wheat	28 slices ²¹	784	76.05	7.06	389.65	1,926	0.392	1.372	0.0125
Butter.....	4 tablespoons.....	56.7	.57	48.20	-----	436	.009	.010	.0001
Celery ²³	1½ cups.....	186	2.05	.19	6.14	34	.145	.069	.0009
Total.....	-----	1,026.7	78.67	55.45	395.79	2,397	.546	1.451	.0135
Individual serving...	1 sandwich of one-half slice bread (56).....	18.3	1.4	1.0	7.1	43	.010	.026	.0002

LETTUCE SANDWICHES (WHOLE WHEAT)

Bread, whole-wheat	28 slices ²¹	784	76.05	7.06	389.65	1,926	0.392	1.372	0.0125
Butter.....	4 tablespoons.....	56.7	.57	48.20	-----	436	.009	.010	.0001
Lettuce ²⁴	2 cups.....	102	1.22	.31	2.96	20	.044	.043	.0007
Total.....	-----	942.7	77.84	55.57	392.61	2,382	.445	1.425	.0133
Individual serving...	1 sandwich of one-half slice bread (56).....	16.8	1.4	1.0	7.0	43	.008	.025	.0002

²⁷ Sherman's values for mineral constituents in fresh tomatoes are applied to the weight of canned tomatoes.

²⁸ Made from 16 slices of whole-wheat bread, as on page 33.

²¹ Whole slices approximately 3¼ by 3¼ by ¾ inches.

²² Finely chopped and measured loosely packed.

²³ Finely shredded and measured loosely packed.

TABLE 12.—*Recipes showing chemical composition*—Continued

SANDWICHES AND TOAST—Continued

WATERCRESS SANDWICHES (WHOLE WHEAT)

Item	Approximate measure	Weight	Protein	Fat	Carbohydrate	Fuel value	Calcium	Phosphorus	Iron
		<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Calories</i>	<i>Gram</i>	<i>Grams</i>	<i>Gram</i>
Bread, whole-wheat	28 slices ³¹ -----	784	76.05	7.06	389.65	1,926	0.392	1.372	0.0125
Butter	4 tablespoons-----	56.7	.57	48.20		436	.009	.010	.0001
Watercress ^{32 34} -----	¾ cup-----	95	.66	.43	3.52	21	.178	.005	.0018
Total-----		935.7	77.28	55.74	393.17	2,383	.579	1.387	.0144
Individual serving---	1 sandwich of one-half slice bread (56).	16.7	1.4	1.0	7.0	43	.010	.025	.0003

TOAST, WHOLE WHEAT, BUTTERED

Bread, whole-wheat	32 slices ³⁵ -----	1,190	115.43	10.71	591.43	2,924	0.595	2.082	0.0190
Evaporation-----		288							
Total after toasting.	32 slices-----	902	115.43	10.71	591.43	2,924	.595	2.082	.0190
Butter-----	7 tablespoons-----	99.2	.99	84.32		763	.015	.017	.0002
Total-----		1,001.2	116.42	95.03	591.43	3,687	.610	2.099	.0192
Individual serving---	½ slice (64)-----	15.6	1.8	1.5	9.2	58	.010	.033	.0003

TOAST CUBES, WHOLE WHEAT

Bread, whole-wheat	16 slices ³⁶ -----	595	57.72	5.36	295.72	1,462	0.298	1.041	0.0095
Evaporation-----		139							
Total after toasting.	320 cubes-----	456	57.72	5.36	295.72	1,462	.298	1.041	.0095
Individual serving---	4 cubes (80)-----	5.7	.7	.1	3.7	18	.004	.013	.0001

DESSERTS

BAKED APPLES

Apples:									
As purchased	30-----	4,937							
Waste-----		483							
Edible portion		4,454	13.36	17.82	663.65	2,868	0.312	0.534	0.0134
Sugar-----	30 tablespoons-----	394			394.00	1,576			
Water-----	4½ cups-----	1,066							
Total-----		5,914	13.36	17.82	1,057.65	4,444	.312	.534	.0134
Evaporation-----		728							
Apples after baking	30-----	4,280							
Liquid-----	3¾ cups-----	906							
Total after baking.		5,186	13.36	17.82	1,057.65	4,444	.312	.534	.0134
Individual serving:									
Baked apple-----	1 (30)-----								
Juice-----	2 tablespoons (30)-----								
Total-----		172.9	.4	.6	35.3	148	.010	.018	.0004

³¹ Whole slices approximately 3¾ by 3¾ by ¾ inch.³² Finely chopped and measured loosely packed.³⁴ Composition from Rose (10, pp. 127, 213).³⁵ Dimensions of each slice before heating are about 3¾ by 3¾ by ½ inch.³⁶ Dimensions of each slice before heating are about 3¾ by 3¾ by ½ inch. Cutting 20 to the slice gives 320 toast cubes.

TABLE 12.—*Recipes showing chemical composition—Continued*

DESSERTS—Continued

APPLE SAUCE

Item	Approximate measure	Weight	Protein	Fat	Carbohydrate	Fuel value	Calcium	Phosphorus	Iron
Apples:		<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Calories</i>	<i>Grams</i>	<i>Grams</i>	<i>Gram</i>
As purchased.....	26.....	4,365							
Waste.....		655							
Edible portion.....		3,710	11.13	14.84	552.79	2,389	0.260	0.445	0.0111
Sugar.....	3 cups.....	630			630.00	2,520			
Water.....	6¼ cups.....	1,481							
Total.....		5,821	11.13	14.84	1,182.79	4,909	.260	.445	.0111
Evaporation.....		883							
Total after cooking.	19 cups.....	4,938	11.13	14.84	1,182.79	4,909	.260	.445	.0111
Unit measure.....	1 cup.....	260	.6	.8	62.3	259	.014	.023	.0006
Individual servings.....	½ cup (37).....	130.0	.3	.4	31.2	129	.007	.012	.0003
	⅓ cup (56).....	86.7	.2	.3	20.8	86	.005	.008	.0002

STEWED APRICOTS

Apricots, dried:									
As purchased.....	4 pounds.....	1,814.4							
Waste.....		110.4							
Edible portion.....		1,704	80.09	17.04	1,065.00	4,734	1.125	1.994	0.0239
Water.....	2½ quarts.....	2,370							
Sugar.....	2 cups.....	420			420.00	1,680			
Total.....		4,494	80.09	17.04	1,485.00	6,414	1.125	1.994	.0239
Evaporation.....		537							
Total after cooking.	14 cups.....	3,957	80.09	17.04	1,485.00	6,414	1.125	1.994	.0239
Unit measure.....	1 cup.....	282	5.7	1.2	105.8	457	.080	.142	.0017
Individual servings.....	½ cup (28).....	141.0	2.9	.6	52.9	229	.040	.071	.0009
	⅓ cup (42).....	94.0	1.9	.4	35.3	152	.027	.047	.0006

CHOCOLATE PUDDING

Chocolate.....	4 squares.....	113.4	14.63	55.23	34.36	693	0.104	0.516	0.0031
Milk.....	4 quarts.....	3,904	128.83	156.16	195.20	2,702	4.685	3.631	.6094
Sugar.....	1½ cups.....	315			315.00	1,260			
Cornstarch.....	2 cups.....	256			230.40	922			
Total.....		4,588.4	143.46	211.39	774.96	5,576	4.789	4.147	.0125
Evaporation.....		215.4							
Total after cooking.	16¾ cups.....	4,373	143.46	211.39	774.96	5,576	4.789	4.147	.0125
Unit measure.....	1 cup.....	260	8.5	12.6	46.1	332	.285	.247	.0007
Individual servings.....	½ cup (33).....	130.0	4.3	6.3	23.0	166	.142	.124	.0004
	⅓ cup (50).....	86.7	2.8	4.2	15.4	111	.095	.082	.0002

TABLE 12.—*Recipes showing chemical composition*—Continued

DESSERTS—Continued

BAKED CUP CUSTARD WITH JELLY

Item	Approximate measure	Weight	Protein	Fat	Carbohydrate	Fuel value	Calcium	Phosphorus	Iron
Milk.....	4 quarts.....	<i>Grams</i> 3,904	<i>Grams</i> 128.83	<i>Grams</i> 156.16	<i>Grams</i> 195.20	<i>Calories</i> 2,702	<i>Grams</i> 4.685	<i>Grams</i> 3.631	<i>Gram</i> 0.0094
Eggs:									
As purchased.....	2 dozen.....	1,283							
Shells.....		157							
Edible portion.....		1,126	150.88	118.23		1,668	.754	2.027	.0338
Sugar.....	1½ cups.....	315			315.00	1,260			
Total.....		5,345	279.71	274.39	510.20	5,629	5.439	5.658	.0432
Butter for greasing cups.	1½ tablespoons.....	21.3	.21	18.10		164	.003	.004	.0000
Total.....		5,366.3	279.92	292.49	510.20	5,793	5.442	5.662	.0432
Evaporation.....		767.3							
Total after baking.		4,599	279.92	292.49	510.20	5,793	5.442	5.662	.0432
Before baking.....	½ cup (43).....	124	6.47	6.76	11.79	134	.126	.131	.0010
After baking.....		106	6.47	6.76	11.79	134	.126	.131	.0010
Individual serving:									
Cooked custard.....	(43).....	106	6.5	6.8	11.8	134	.126	.131	.0010
Jelly.....	½ teaspoon.....	5	.1		3.9	16	.001	.000	.0000
Total.....		111	6.5	6.8	15.7	150	.127	.131	.0010

CUSTARD SAUCE

Milk.....	2½ quarts.....	2,440	80.52	97.60	122.00	1,688	2.928	2.260	0.0059
Sugar.....	1 cup.....	210			210.00	840			
Egg yolks.....	24.....	495	77.72	164.84		1,794	.678	2.594	.0426
Total.....		3,145	158.24	262.44	332.00	4,323	3.606	4.863	.0485
Evaporation.....		316							
Total after cooking.	11½ cups.....	2,829	158.24	262.44	332.00	4,323	3.606	4.863	.0485
Unit measure.....	1 cup.....	250	14.0	23.2	29.3	362	.319	.430	.0043
Individual serving.....	¼ cup (46).....	62.5	3.5	5.8	7.3	96	.080	.108	.0011

TABLE 12.—*Recipes showing chemical composition—Continued*

DESSERTS—Continued

FLOATING ISLAND

Item	Approximate measure	Weight	Protein	Fat	Carbohydrate	Fuel value	Calcium	Phosphorus	Iron
		<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Calories</i>	<i>Grams</i>	<i>Grams</i>	<i>Gram</i>
Milk.....	3 quarts.....	2,928	96.62	117.12	146.40	2,026	3.514	2.723	0.0070
Egg yolks.....	18.....	360	56.52	119.88	—	1,305	.493	1.886	.0310
Sugar.....	1½ cups.....	236	—	—	236.00	944	—	—	—
Total.....	—	3,524	153.14	237.00	382.40	4,275	4.007	4.609	.0380
Evaporation.....	—	315	—	—	—	—	—	—	—
Total after cooking.....	12¾ cups.....	3,209	153.14	237.00	382.40	4,275	4.007	4.609	.0380
Unit measure.....	1 cup.....	250	11.9	18.5	29.8	333	.312	.359	.0030
Egg whites.....	10.....	300	—	—	—	—	—	—	—
Loss in manipulation.....	—	10	—	—	—	—	—	—	—
Egg whites (beaten stiff).....	9¾ cups.....	290	35.67	.58	—	148	.044	.041	.0003
Unit measure.....	1 cup.....	30	3.7	.1	—	15	.005	.004	.0000
Individual servings:									
Custard.....	½ cup (25).....	125	6.0	9.2	14.9	167	.156	.180	.0015
Egg white.....	¾ cup (25).....	11	1.4	.0	—	6	.002	.002	.0000
Total.....	—	136	7.3	9.2	14.9	172	.158	.182	.0015
Custard.....	½ cup (38).....	83.3	4.0	6.2	9.9	111	.104	.120	.0010
Egg white.....	¾ cup (38).....	7.5	.9	.0	—	4	.001	.001	.0000
Total.....	—	90.8	4.9	6.2	9.9	115	.105	.121	.0010

FRUIT CUP

Dates:									
As purchased.....	1 package.....	330	—	—	—	—	—	—	—
Waste.....	—	41	—	—	—	—	—	—	—
Edible portion.....	—	289	6.07	8.09	226.58	1,003	0.188	0.162	0.0087
Oranges:									
As purchased.....	1 dozen.....	2,011	—	—	—	—	—	—	—
Waste.....	—	864	—	—	—	—	—	—	—
Edible portion.....	—	1,147	10.32	2.29	128.46	576	.516	.241	.0023
Canned pineapple: ³⁷									
Slices.....	24.....	1,822.5	—	—	—	—	—	—	—
Sirup.....	3 cups.....	783	—	—	—	—	—	—	—
Total.....	3 No. 2½ cans.....	2,605.5	10.42	38 2.61	604.48	2,483	.328	.510	.0091
Total.....	15¼ cups.....	4,041.5	26.81	12.99	959.52	4,062	1.032	.913	.0201
Unit measure.....	1 cup.....	267	1.8	.9	63.4	268	.068	.060	.0013
Individual servings:									
½ cup (30).....	—	133.5	.9	.4	31.7	134	.034	.030	.0007
½ cup (45).....	—	89.0	.6	.3	21.1	89	.023	.020	.0004

³⁷ Percentages for protein, fat, and carbohydrate taken from analysis of fancy sliced pineapple, (3, p. 4) Minerals calculated by applying Sherman's figures for fresh pineapple to the weight of drained solids.

³⁸ Figure for fat assumed.

TABLE 12.—*Recipes showing chemical composition—Continued*

DESSERTS—Continued

OATMEAL COOKIES

Item	Approximate measure	Weight	Protein	Fat	Carbohydrate	Fuel value	Calcium	Phosphorus	Iron
		<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Calories</i>	<i>Grams</i>	<i>Grams</i>	<i>Gram</i>
Eggs, edible portion.	3.....	134	17.96	14.07		198	0.090	0.241	0.0040
Milk.....	1 cup.....	244	8.05	9.76	12.20	169	.293	.227	.0006
Sugar.....	6½ tablespoons.....	85.3			85.3	341			
Butter.....	½ cup.....	113.4	1.13	96.39		872	.017	.019	.0002
Oatmeal.....	2 cups.....	164	27.39	11.97	108.57	652	.113	.643	.0062
Flour.....	3 cups.....	300	33.60	3.00	224.70	1,060	.060	.276	.0030
Soda.....	¾ teaspoon.....	2.5							
Baking powder.....	½ teaspoon.....	1.5							
Raisins.....	1½ cups.....	227	5.90	7.49	172.75	782	.145	.300	.0048
Total.....		1,271.7	94.03	142.68	603.52	4,074	.718	1.706	.0188
Evaporation.....		279.7							
Total after baking.	62 cookies.....	992	94.03	142.68	603.52	4,074	.718	1.706	.0188
Individual serving.....	1 cooky.....	16	1.5	2.3	9.7	66	.012	.028	.0003

PEARS, CANNED

Canned pears: ³⁹									
Halves.....	27.....	1,180							
Sirup.....	2¼ cups.....	601							
Total.....	3 No. 2 cans.....	1,781	5.34	5.34	320.58	1,352	0.177	0.307	0.0035
Individual serving:									
Halves.....	1 (27).....	43.7							
Sirup.....	4 teaspoons (27).....	22.3							
Total.....		66	.2	.2	11.9	50	.007	.011	.0001

STEWED PRUNES

Prunes:									
As purchased.....	6 pounds.....	2,722							
Stones.....		410							
Edible portion.....		2,312	48.55 ³⁸	11.56	1,694.70	7,077	1.248	2.428	.0694
Water.....	10¾ cups.....	2,528							
Total (with stones).		5,250	48.55	11.56	1,694.70	7,077	1.248	2.428	.0694
Evaporation.....		625							
Total after cooking.		4,625	48.55	11.56	1,694.70	7,077	1.248	2.428	.0694
Stones.....		410							
Waste clinging to stones. ⁴⁰		192	2.21	.53	77.28	323	.057	.111	.0032
Cooked pulp used.....		4,023	46.34	11.03	1,617.42	6,754	1.191	2.317	.0662
Orange juice.....	1 cup.....	250	1.5	.0	32.7	137	.072	.040	.0005
Total.....	15¾ cups.....	4,273	47.84	11.03	1,650.12	6,891	1.263	2.357	.0667
Unit measure.....	1 cup.....	277	3.1	.7	107.0	447	.032	.153	.0043
Individual servings.....	½ cup (30).....	138.5	1.6	.4	53.5	223	.041	.076	.0022
	¼ cup (46).....	92.3	1.0	.2	35.7	149	.027	.051	.0014

³⁸ Figure for fat assumed.³⁹ Mineral calculations are based on the weight of drained solids, using Sherman's figures for fresh pears.⁴⁰ In allowing for this loss it is assumed that 4.56 per cent of each nutrient is discarded since the waste pulp is this percentage by weight of the total edible portion after cooking (4,215 grams).

TABLE 12.—*Recipes showing chemical composition*—Continued

DESSERTS—Continued

PRUNE WHIP WITH CUSTARD SAUCE

Item	Approximate measure	Weight	Protein	Fat	Carbohydrate	Fuel value	Calcium	Phosphorus	Iron
		<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Calories</i>	<i>Grams</i>	<i>Grams</i>	<i>Gram</i>
Prunes (dry):									
As purchased.....	2¼ pounds.....	1,021							
Stones.....		142							
Edible portion.....		879	18.46	38 4.40	644.31	2,691	0.475	0.923	0.0264
Water.....	4¾ cups.....	1,103							
Total (with stones).....		2,127							
Evaporation.....		308							
Total after cooking.....		1,819	18.46	4.40	644.31	2,691	.475	.923	.0264
Stones.....		142							
Waste clinging to stones. ⁴¹		45	.49	.12	17.27	72	.013	.025	.0007
Cooked pulp.....		1,632	17.37	4.28	627.04	2,619	.462	.838	.0257
Loss in sieving ⁴²		276	3.04	.72	106.08	443	.078	.152	.0343
Pulp used.....		1,356	14.93	3.56	520.96	2,176	.384	.746	.0214
Egg whites beaten ⁴³	2 dozen.....	600	73.80	1.20		306	.060	.084	.0006
Sugar.....	1 cup.....	210			210.00	840			
Orange juice.....	½ cup.....	125	.75	.00	16.37	69	.036	.020	.0002
Butter for pan.....	2 tablespoons.....	28.4	.28	24.14		218	.004	.005	.0001
Total.....		2,319.4	89.76	28.90	747.33	3,608	.514	.855	.0223
Evaporation.....		204.4							
Total after cooking.....		2,115	89.76	28.90	747.33	3,608	.514	.855	.0223
Individual serving:									
Prune whip.....	2 by 2 by 1½ inches (47).....	45	1.9	.6	15.9	77	.011	.018	.0005
Custard sauce ⁴³	¼ cup.....	62.5	3.5	5.8	7.3	96	.080	.103	.0011
Total.....		107.5	5.4	6.4	23.2	172	.091	.126	.0016

RICE PUDDING WITH RAISINS (BAKED)

Milk.....	5 quarts.....	4,880	161.04	195.20	244.00	3,377	5.856	4.538	0.0117
Rice (brown) ⁴⁶	3 cups.....	606	48.48	1.82	478.74	2,125	.055	1.254	.0121
Raisins.....	2¾ cups.....	435	11.31	14.36	331.04	1,499	.278	.574	.0091
Sugar.....	1½ cups.....	315			315.00	1,260			
Butter.....	1 tablespoon.....	14.2	.14	12.07		109	.002	.002	.0000
Total.....		6,250.2	220.96	222.43	1,368.78	8,361	6.191	6.368	.0329
Evaporation.....		750.2							
Total after baking 5 hours.....	20¾ cups.....	5,500	220.96	222.43	1,368.78	8,361	6.191	6.368	.0329
Unit measure.....	1 cup.....	265	10.6	10.7	65.9	403	.298	.307	.0016
Individual servings.....	½ cup (41).....	132.5	5.3	5.4	33.0	201	.149	.154	.0008
	½ cup (62).....	88.3	3.5	3.6	22.0	134	.099	.102	.0005

⁴¹ Losses of nutrients in sieving are calculated on the assumption that the material lost is of the same composition as the total cooked material.

⁴² Proximate composition and calcium are calculated on the basis of figures for white rice; phosphorus and iron are calculated from figures for brown rice.

⁴³ Figure for fat assumed.

⁴⁴ In allowing for the loss it is assumed that 2.68 per cent of each nutrient is discarded, since the waste pulp is this percentage by weight of the total edible portion after cooking (1,677 grams).

⁴⁵ Nutrients calculated from the weight of beaten whites on the assumption that loss of moisture during beating is negligible.

⁴⁶ From recipe for custard sauce given on p. 38.

TABLE 12.—*Recipes showing chemical composition*—Continued

DESSERTS—Continued

SPONGE CAKE WITH STEWED APRICOTS

Item	Approximate measure	Weight	Protein	Fat	Carbohydrate	Fuel value	Calcium	Phosphorus	Iron
		<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Calories</i>	<i>Grams</i>	<i>Grams</i>	<i>Gram</i>
Eggs:									
As purchased	10	551							
Shells		67							
Edible portion		484							
Whites		291							
Whites after beating. ⁴²		284	34.93	0.57		145	.043	.040	.0003
Yolks		193	30.30	64.27		700	.264	1.011	.0166
Total		477	65.23	64.84		844	.307	1.051	.0169
Sugar	2 cups	420			420.00	1,680			
Flour	2 cups	200	22.40	2.00	149.80	707	.040	.184	.0020
Orange juice	2 tablespoons	31	.19	.00	4.06	17	.009	.005	.0001
Total		1,128	87.82	66.84	573.86	3,248	.356	1.240	.0190
Evaporation		111							
Total after baking.		1,017	87.82	66.84	573.86	3,248	.356	1.240	.0190
Individual serving:									
Sponge cake	1⅞ by 2¼ by 1½ inches (32).	31.8	2.7	2.1	17.9	102	.011	.039	.0006
Stewed apricots ⁴⁴	¾ cup	70.5	1.4	.3	26.5	114	.020	.036	.0004
Total		102.3	4.1	2.4	44.4	216	.031	.075	.0010

TAPIOCA WITH PINEAPPLE

Milk	3 quarts	2,928	96.62	117.12	146.40	2,026	3.514	2.723	0.0070
Eggs	1 dozen	600	80.40	63.00		889	.402	1.080	.0180
Sugar	1½ cups	315			315.00	1,260			
Tapioca	2 cups	352	1.41	.35	309.76	1,248	.081	.317	.0056
Canned pineapple: ³⁷									
Slices	16	1,232							
Sirup	1½ cups	499							
Total		1,731	6.92	³⁸ 1.73	401.59	1,650	.222	.345	.0062
Total		5,926	185.35	182.20	1,172.75	7,072	4.219	4.465	.0368
Evaporation		303							
Total after cooking	2¼ cups	5,623	185.35	182.20	1,172.75	7,072	4.219	4.465	.0368
Unit measure	1 cup	257	8.5	8.3	53.6	323	.193	.204	.0017
Individual servings	½ cup (43)	128.5	4.2	4.2	26.8	162	.096	.102	.0008
	¾ cup (65)	85.7	2.8	2.8	17.9	108	.064	.068	.0006

³⁷ Percentages for protein, fat, and carbohydrates taken from analysis of fancy sliced pineapple, (3, p. 4). Minerals calculated by applying Sherman's figures for fresh pineapple to the weight of drained solids.

³⁸ Figure for fat assumed.

⁴² Nutrients calculated from the weight of beaten whites on the assumption that loss of moisture during beating is negligible.

⁴⁴ Composition taken from p. 37.

TABLE 12.—*Recipes showing chemical composition—Continued*

BEVERAGES AND MISCELLANEOUS

MILK

Item	Approximate measure	Weight	Protein	Fat	Carbohydrate	Fuel value	Calcium	Phosphorus	Iron
		Grams	Grams	Grams	Grams	Calories	Grams	Grams	Gram
Milk	{ 1 cup.....	244	8.1	9.8	12.2	169	0.293	0.227	0.0006
	{ ¾ cup.....	162.7	5.4	6.5	8.1	113	.195	.151	.0004
	{ ½ cup.....	122.0	4.0	4.9	6.1	84	.146	.114	.0003
	{ ¼ cup.....	81.3	2.7	3.3	4.1	56	.098	.076	.0002

COCOA

Milk	6 quarts	5,856	193.25	234.24	292.80	4,052	7.027	5.446	0.0141
Cocoa	1 cup	130	28.08	37.57	49.01	646	.146	.922	.0035
Sugar	2 cups	420			420.00	1,650			
Total		6,406	221.33	271.81	761.81	6,379	7.173	6.368	.0176
Evaporation		172							
Total after cooking	25 cups	6,234	221.33	271.81	761.81	6,379	7.173	6.368	.0176
Unit measure	1 cup	250	8.9	10.9	30.5	256	.288	.255	.0007
Individual servings	{ ¾ cup (37)	166.6	5.9	7.3	20.4	171	.192	.170	.0005
	{ ½ cup (50)	125.0	4.4	5.4	15.3	129	.144	.128	.0004
	{ ¼ cup (75)	83.3	3.0	3.6	10.2	85	.096	.085	.0002

ORANGE JUICE

Oranges, medium:									
As purchased	31	6,524							
Skin		2,725							
Edible portion		3,799							
Pulp		637							
Juice	12½ cups	3,162	18.97	0.00	414.22	1,733	0.917	0.506	0.0063
Unit measure	1 cup	250	1.5	.0	32.7	137	.072	.040	.0005
Individual servings	{ ½ cup (25)	125.0	.7	.0	16.4	69	.036	.020	.0002
	{ ¼ cup (38)	83.3	.5	.0	10.9	46	.024	.013	.0002

TOMATO JUICE

Canned tomatoes	4 No. 3 cans	3,927							
Loss in straining		471							
Strained tomatoes ⁴⁵	14¼ cups	3,456	41.47	6.91	138.24	781	0.207	0.518	0.0138
Sugar	½ cup	105			105.00	420			
Cloves	¼ teaspoon								
Cinnamon	½ teaspoon								
Total	14½ cups	3,561	41.47	6.91	243.24	1,201	.207	.518	.0138
Unit measure	1 cup	246	2.9	.5	16.8	83	.014	.036	.0010
Individual servings	{ ½ cup (29)	123.0	1.4	.2	8.4	41	.007	.018	.0005
	{ ¼ cup (43)	82.0	1.0	.2	5.6	28	.005	.012	.0003

COD-LIVER OIL

Cod-liver oil	1 tablespoon	13		13		117			
Individual serving		2.4		2.4		22			

⁴⁵ The strained tomatoes are assumed to have the same composition as the canned tomatoes before straining. Sherman's figures for calcium and phosphorus in tomato juice and iron in fresh tomatoes, are applied to the weight of tomatoes after straining.

SUMMARY

Several studies of food intake of normal children from 2 to 6 years of age are presented and compared as a basis for formulating food standards for preschool children. From this the energy and protein standard per kilogram of body weight for a 3-year-old child are taken as 99 calories and 3.5 grams, respectively, the results of the study at the Merrill-Palmer School being used as criteria. A gram each of calcium and phosphorus per day are regarded as adequate quantities for all children from 2 to 6. A standard of about 0.61 milligram of iron per kilo of body weight or a total intake of about 9 milligrams per day for the average 3-year-old child is adopted.

The various factors which affect the child's appetite may markedly influence his food intake. Interest in eating may be affected by the child's physical condition, by the emotional atmosphere before and at mealtime, by the esthetic appeal of the food, and by the ease with which the child handles it. It is important, therefore, in developing correct food habits to consider all of these factors.

Midday meals at the nursery school, with supplementary mid-morning and mid-afternoon feedings, are considered satisfactory if they supply half of the day's protein, total calories, and phosphorus, and somewhat more than half of the calcium and iron, together with liberal quantities of vitamin-rich foods. Menus are presented to illustrate how this supply can be provided, and some general suggestions are given for planning other suitable midday meals as a practical nursery-school problem. That such meals are well received by the children is shown by a report on the number of second servings during five consecutive days.

The cost of the midday meals at the Merrill-Palmer School over a 20-week period from January to May, 1930, averaged 17.0 cents per child per day for the raw materials, varying from 11 to 29.8 cents. A few high-cost and a few low-cost meals are presented with some suggestions on economy. The substitution of tomato juice for orange juice reduces the cost of materials without sacrifice in nutritive value.

Recipes for numerous prepared dishes appropriate for use in nursery schools are presented, with calculations of their chemical composition. These are more satisfactory for making dietary studies with groups of children than data on the composition of cooked foods formerly available, because they are designed for the purpose, and they show definitely the weights of the food materials used as well as the weight of the finished product.

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<i>Division Foods and Nutrition</i>	LOUISE STANLEY, <i>in Charge</i> .



